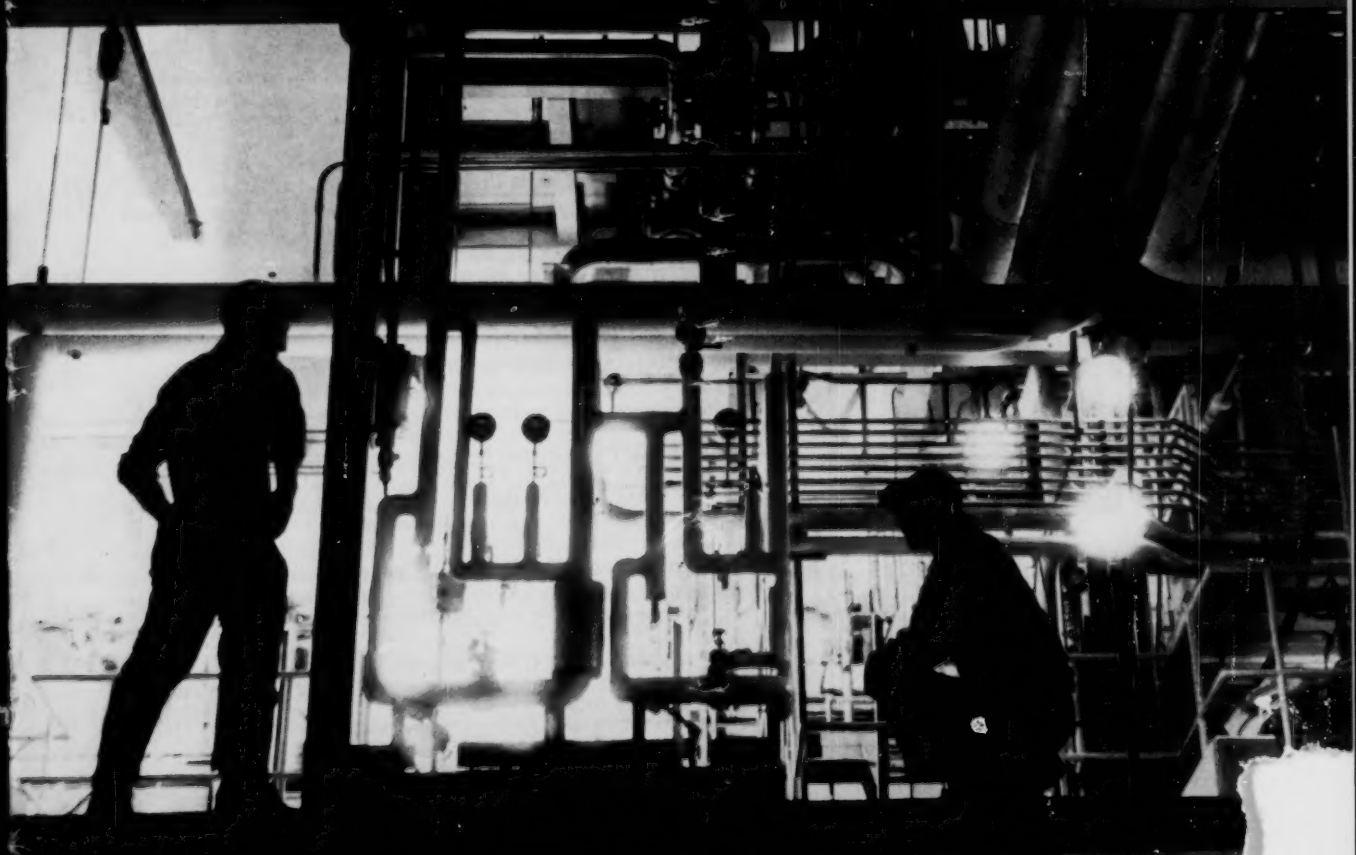
THE MAGAZINE OF

Standards



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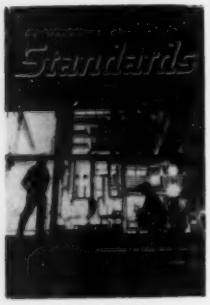

Some of the approximately 100,000 feet of pipes that run throughout the Shippingport atomic-electric power station. Dedicated early this spring, the station is USA's first full-scale atomic-electric generating plant providing electricity entirely for civilian needs. It is a joint venture of the Atomic Energy Commission and the Duquesne Light Company. Westinghouse designed and developed the nuclear reactor under contract with AEC. Piping network is in underground chamber housing pipes, valves, and related equipment for operation of nuclear reactor and turbine-generator.

ASA

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In the January 1954 issue of The MAGAZINE OF STANDARDS, Leo B. Moore, then assistant professor of industrial management at the Massachusetts Institute of Technology, introduced himself in his first "Standards Outlook" column. For four-and-one-half years he has devotedly continued to give readers of the magazine his personal comments and views on standards.

His columns have been widely read, reprinted, mentioned at meetings of standards engineers, and used as a stimulus to new methods and policies.

Now, Professor Moore has decided to move into new standards activities. He sees a vast amount of work ahead and feels there is need of his energy and efforts in helping to make standards engineering "professional in every sense of the word." He has already taken steps to put some of his ideas into effect, and, as he explains, to start moving toward standards research and increased educational effort.

Therefore, Professor Moore's column in this issue is the last one to be published. His illuminating comments and analyses of standards problems will be sadly missed.

Perhaps it is fitting that announcement of the award Professor Moore has received, specifically mentioning his "Standards Outlook" columns, should appear in this issue (page 246).

When Professor Moore first mentioned that he planned to stop writing the monthly columns, he said that he wanted to write feature articles instead. We took him at his word. His first full-length feature article, "Standards—A Management Resume for Difficult Times" will appear in the September issue.

The September issue will also feature special reports of this year's plenary meetings of the International Organization for Standardization and the International Electrotechnical Commission.

• A cumulative supplement to the 1958 Price List of American Standards has just been compiled. Copies of the multilith document (dated July 1958) are available without charge from the American Standards Association.

This Month's Standards Personality

IRA J. HIRSH is a young man whose research in connection with hearing has brought him world-wide recognition and one of the highest honors in the field of acoustics. In standardization he is known as an active member of the former Sectional Committee Z24 on Acoustics, and as chairman of the Writing Group that developed the American Standard Method for Measurement of Real-Ear Attenuation of Ear Protectors at Threshold (see "How Good Is an Ear Protector?" MAG OF STDS, May, 1958, page 139). Dr Hirsh is research associate at the Central Institute for the Deaf; associate professor of psychology at Washington University, St. Louis, Missouri; and research associate in audiology, Department of Otolaryngology, Washington University School of Medicine.

Still only in his thirties, he has received one of the top honors in the acoustical field, the Acoustical Society of America's Biennial Award.

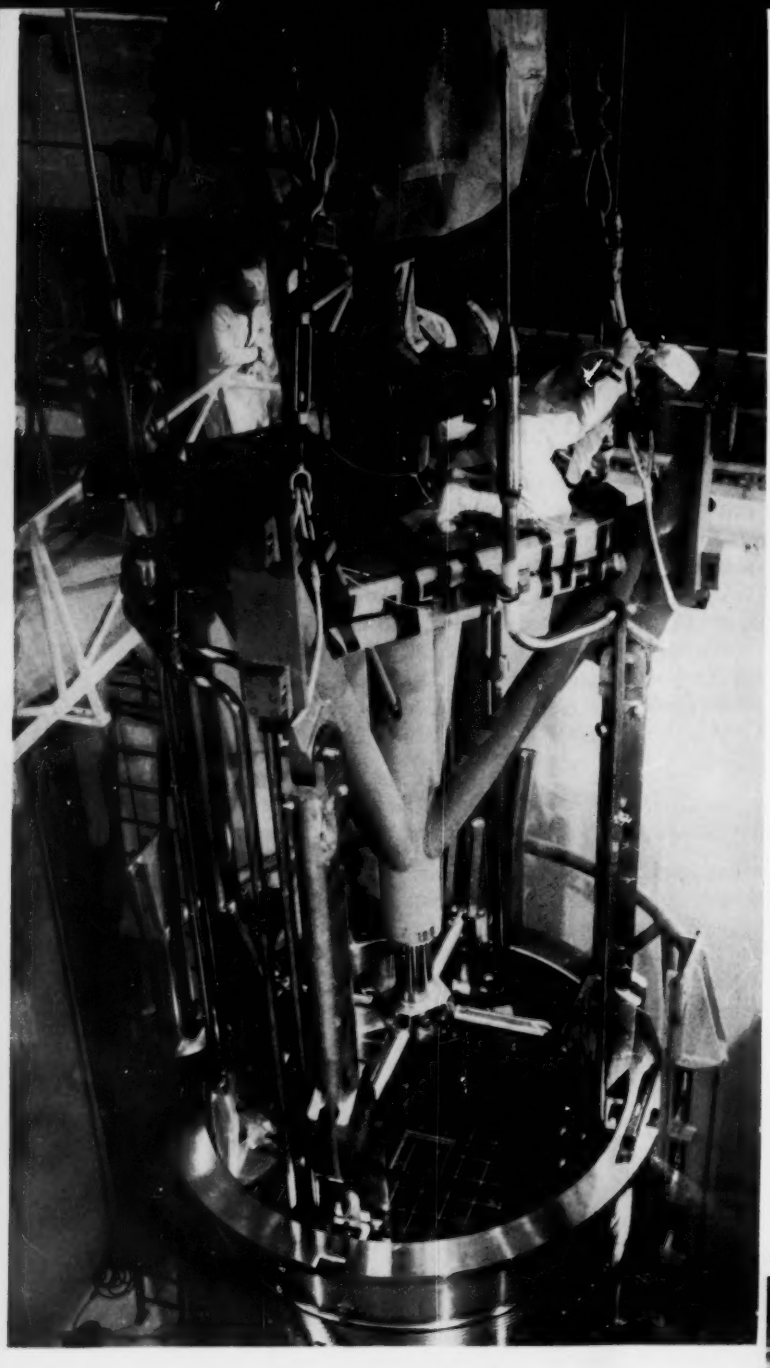
Dr Hirsh is known throughout the world as author of *Measurement of Hearing*, a reference book for otologists and audiologists that has been adopted as the authority in its field by many universities, not only in this country but also abroad. The book has been translated into French. Dr Hirsh also serves as consultant in audiology to the U.S. Air Force, School of Aviation Medicine, and as consultant on hearing aids to the Veterans Administration. He is a member of the Armed Forces-National Research Council Committee on Hearing and Bioacoustics as well as a member of the Executive Council of the American Speech and Hearing Association. For a number of years he was associate editor of the *Journal of Speech and Hearing Disorders*.

Ira Hirsh started his career by studying to be a teacher. However, he took the path he was to follow when he received the C. C. Bunch Scholarship in the School of Speech at Northwestern University. In college he majored in English and mathematics, an unusual combination. His two strong extra-curricular interests were dramatics and debating. He put to work what he learned in all these activities as an evening radio announcer at station WBBM (FM). He first became interested in hearing rather than speech while in military service (1943-1946), where he first served as communications officer in the Medical Department, and then as aural rehabilitation officer.

The difficulty users of hearing aids find in localizing the sources of sound became one of the problems of special interest to him. This interest influenced him into entering the psycho-acoustics laboratory at Harvard University, where he received his Ph.D. in psychology in 1948, and where he worked first as research assistant and then as research fellow until 1951.

Among the problems of special interest to Dr Hirsh, and which he has investigated, is the way in which sound masks or obliterates the hearing of other sounds, particularly speech. He has also studied the loss of sensitivity of hearing that follows exposure to noise and the time course of the recovery of normal sensitivity.

In his private life, Dr Hirsh is married and is the father of four children, two girls and two boys.



This paper was presented at the twenty-sixth annual meeting of the American Society of Tool Engineers in Philadelphia, Pennsylvania, May 1-8, 1958. It is reproduced here by permission of the Society.

All photos courtesy of Westinghouse

USA made a start in using nuclear energy to generate electric power for civilians when the Shippingport, Pa., plant was dedicated early this year. Above, in one of final stages of preparing plant, the 58-ton core, or nuclear fuel charge, is being lowered gently and slowly into pressure vessel, or steel container. Aerial view of Shippingport station (right) shows long, dark building containing nuclear portion of plant.

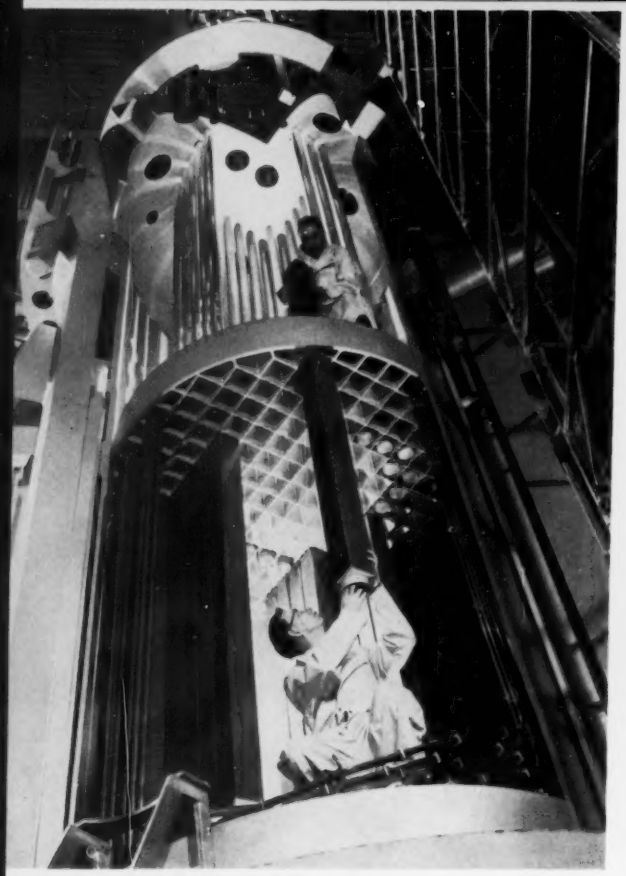
HOMES and factories of Greater Pittsburgh area are receiving electricity produced at the Shippingport plant and transmitted through Duquesne Light Company system.

STANDARDIZATION IN THE NUCLEAR INDUSTRY

by **Henry H. Hausner**

STANDARDIZATION is a means of cost reduction through conservation of manpower and materials. The nuclear industry designs and builds nuclear reactors and components; however, the cost of today's power reactors is still so extremely high and the power produced is so expensive that nuclear power in this country is not yet economic and won't be economic for quite some years. If standardization is actually a means of cost reduction, it is highly desirable and badly needed in the nuclear industry.

Our cost calculations for nuclear power plants are not very reliable. There are rumors that the cost of a kilowatthour from the first nuclear, large-scale power plant, the Shippingport reactor plant, will be approximately 63 mills, which is about seven times as much as a kilowatthour price of a conventional power plant. The Shippingport reactor, however, is the first large-scale reactor of this type ever built, and it is said that the actual reactor cost is approximately three times that originally calculated. Based on this and similar experiences in the reactor industry, General Electric recently announced that they will not take any fixed price orders for nuclear power reactors. Mr Alfred Iddles, president of Babcock & Wilcox, at their last annual meeting, told the stockholders that "We cannot predict when the activities of this (Atomic Energy) Division will become profitable." And Mr Karl M. Mayer, one of the experts in the nuclear power economy, stated



WOODEN model of fuel element being moved into position inside full-scale mock-up of pressurized water reactor for Shippingport atomic power station. In actual reactor, heat is generated by core comprised of 14 tons of natural uranium in form of "blanket" surrounding some 165 pounds of highly enriched uranium "seed." There are 32 "seed" elements and 113 "blanket" elements. Tubing is used for instrumentation.

quite plainly that "The market for high cost nuclear power in North America in the 1960-1970 period is the most unattractive market in the world."

Why are nuclear reactors so expensive, and why is the nuclear power price so uneconomically high? To a large extent the reactor builder already knows the answers:

1. We do not have enough experience in the production of nuclear reactors because not enough reactors of one single type have yet been built. Instead, we produce reactors of various types in order to determine the most efficient one for any desired purpose. Here in the United States, we are actually not pressed to build nuclear power plants because we still have plenty of fossil fuel, for the next 40 to 70 years, for the operation of conventional power plants from which we have sufficient experience to build such plants for the production of low cost power.

2. We know that the nuclear reactor offers potential hazards. We are afraid of these hazards, and are not advanced and experienced enough to keep these potential dangers within their limits by inexpensive means. Today we apply a large number of safety precautions in a nuclear reactor and their costs represent a sizable factor in the construction costs. With more experience in the operation of nuclear reactors and with better evaluation of the potential dangers, we probably will be able to simplify the safety precautions considerably, and also lower costs.

3. We have to select engineering materials for nuclear reactors, not only with respect to their mechanical and chemical behavior, but with respect to an entirely new consideration: their nuclear cross section, i.e., their reaction with neutrons. Many new materials are seriously considered for nuclear power reactors, such as beryllium which is an excellent moderator. However, the material presently costs $150 per pound, which makes it impossible to produce power at a reasonable cost. Years may pass before the beryllium price will justify the use of this highly desirable material in the reactor. We already apply zirconium and zirconium alloys as reactor materials. These are still extremely expensive, but offer so many engineering advantages that we use them regardless of their price. All these prices will decrease at a later date, when we will have larger production of nuclear reactors and more experience in designing them.

4. The materials in nuclear reactors are exposed to various environmental conditions: high temperature, high pressure, chemical and corrosive conditions. These materials are, however, also exposed to a new environment: radiation conditions; and very little, and definitely not enough, is known about the behavior of various materials under irradiation, and especially on the correlation between irradiation and the corrosion rate, irradiation and the creep of materials—just to mention a few examples.

5. Engineering problems in the construction of nuclear power reactors still give headaches because we do not yet have them under control. Several reactor difficulties were due to excessive corrosion, or due to welding failures. On account of these problems, materials or methods are used in reactor construction which are expensive.

6. The nuclear fuel cost, which varies between 20 percent and 40 percent of the total reactor cost, is a completely developed and established component of the reactor, but still the subject of research and development. A rough review of the fuel situation indicates that at least 50 different types of solid or liquid nuclear fuels are presently under consideration.

All the above reasons indicate that we cannot simply build a nuclear reactor, as is done with a conventional steam plant, but that quite some research and development work is necessary for every reactor to be built, and one hardly can estimate the costs for this development. It is, therefore, quite understandable that some of the reactor building companies no longer take any fixed price orders.

With all the above in mind, any standardization expert will be able to conclude that standardization in

nuclear engineering is premature, but he will agree also that it is not too early to study and examine what kind of standards will be desirable one day, when nuclear engineering will be more advanced. In consideration of the fact that standardization is a means of cost reduction, everyone will be convinced that one has to apply standardization in nuclear engineering in order to reduce the high cost of production.

What kind of standards should be taken into consideration? I should like to state that one needs basically three different directions for this type of standardization:

1. Standards to facilitate communication for a better understanding among the nuclear engineers, i.e., standards of nomenclature and definitions;
2. Safety standards, such as for handling raw material production and components, reactor design and operations, transportation of the active material, and the recovery of nuclear fuel;
3. Material and components standards, such as raw material purity, processing standards for quality reasons and dimensional shapes.

This is by no means a complete outline for standardization in the field of nuclear engineering but just a framework for a start.

A short time ago the American Standards Association (ASA) set up a Nuclear Standards Board which has established a number of projects. These projects are handled by professional and scientific societies, such as the American Nuclear Society, the American Society of Mechanical Engineers, Atomic Industrial Forum, American Society for Testing Materials, and others. The projects were divided approximately as follows:

General and administrative standards for nuclear energy
Nuclear instrumentation
Electrical requirements for reactors and nuclear power systems, and generation and application of nuclear radiation
Chemical engineering for the nuclear field
Reactor safety
Radiation protection

In view of the increasing national activity in isolated phases of standardization in the field of nuclear energy, it was obviously desirable to have an international group examine the broad aspects of the problem in an attempt to expedite standards in areas where they may be practical. Accordingly, the International Organization for Standardization's Council at a meeting in Geneva, Switzerland, July 16-20, 1956, adopted the following resolution:

"On the recommendation of the Planning Committee (PLACO) the Council decided

"a) to call to the attention of all technical committees concerned the fact that exposure of materials and equipment to nuclear flux imposes on them special conditions which must be especially considered by cognizant committees to the end that, if needed, special modifications of existing ISO Recommendations may be undertaken, or draft proposals having such conditions particularly in view may be developed at high priority. In this connection, technical committees should note the desirability of requesting members to include in their representation individuals specially qualified in nuclear energy fields. Because of the rapid developments in this new field, it may be expected that ISO Recommendations pertaining to the field will require more than normally frequent revisions.

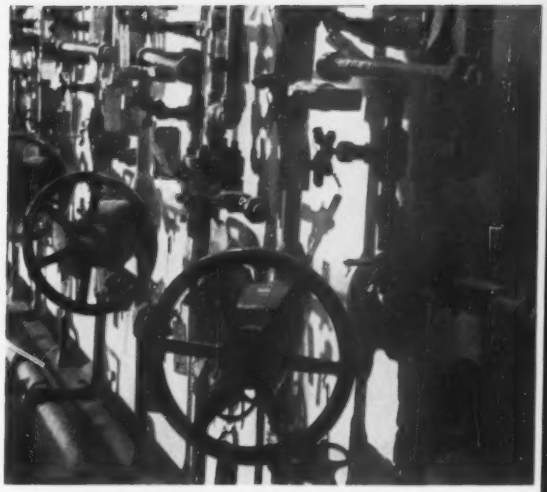
"b) to authorize immediate establishment of a technical committee on nuclear energy with a scope embracing those aspects of nuclear energy not within the scopes of technical committees already in existence. This new technical committee should be instructed to do its work by medium of subcommittees of which three should be established without delay to handle nuclear energy standardization at the ISO level in:

1) Terminology
2) Safety standards for the protection of persons against the hazards from nuclear radiation
3) Standards for the safe and effective operation of reactors.

"The initiation of these steps should be notified to all member-bodies and to existing international organizations in the nuclear field—both governmental and nongovernmental—to the end that duplication of effort may be avoided and competent work already accomplished may be placed in its proper perspective.

"c) to approve the text proposed by the Planning Committee (PLACO) for the statement on nuclear energy to be addressed to the United Nations (document ISO/COUNCIL 1956, 11 A 1 Corr. 1)."

This resolution was forwarded to the member-bodies of ISO including the American Standards Association which is the United States member of ISO. [1]



SOME 2500 valves play key role in Shippingport operations. Valves shown here are located inside auxiliary container through which steam generated by atomic furnace passes to turbine-generator that produces electricity.

On July 29, 1957, the first meeting of ISO/TC 85[1] was held at Geneva, Switzerland, under the chairmanship of Mr Morehead Patterson of the United States. There were 61 delegates representing Belgium, France, Finland, Germany, Italy, Japan, Netherlands, Poland, United Kingdom, United States, USSR and Yugoslavia. In addition, there were observers from Brazil, Greece, India, and Switzerland as well as the European Organization for Nuclear Research, International Electrotechnical Commission, International Commission on Radiological Protection, International Commission on Radiological Units, International Labor Organization, United Nations Educational, Scientific and Cultural Organization, and the World Health Organization.

The United States delegation under Admiral Kitts' chairmanship consisted of 14 members including 2 members of the secretariat.

At the opening plenary session two important actions were taken. First, the committee adopted a plan of action which consisted of establishing three working groups in the most pressing areas. These working groups and their secretariats are as follows:

1. Terminology	United States
2. Radiation protection	France
3. Reactor safety	United Kingdom

In 1953, The American Society of Mechanical Engineers published for the National Research Council a "Glossary of Terms in Nuclear Science and Technology." In the summer of 1957 the ASA, through the Nuclear Standards Board, approved this glossary as an American Standard. Some of the nomenclature and definitions included in the Glossary, however, were not acceptable to several of the organizations represented on the Board, and approval was obtained only on the condition that a revision of the Glossary be started immediately. In the meantime, the ASA has accepted the sponsorship of a project to develop a tri-lingual international glossary under the International Organization for Standardization.

Among the activities of the ASA's project on General and Administrative Standards for Nuclear Energy are three parts of greatest interest:

1. Color codes and symbols;
2. Industrial radiation exposure records systems;
3. Qualifications of nuclear professionals.

At the present time several radiation symbols are in use in this country, but the one most frequently used is the three-bladed propeller-type symbol in purple color on a yellow background. The ASA committee has drafted a proposed American Standard which would adopt this symbol, set uniform specifications for it, and establish general rules for its use. The proposal has been circulated to about 100 organizations for comment. However, immediate approval of the symbol is not expected because several national and international transportation groups and the International Labor Organization strongly favor certain other symbols. Considerable discussion and compromise may be necessary before a uniform symbol can be adopted.

During the last few years, agencies of government, labor unions, medical and public health associations, legal and insurance organizations, and many other groups have become very concerned over the hazards of the industrial use of radiation. A number of these groups have been agitating for strong radiation protection controls. Many of the proposals from these groups have included elaborate radiation exposure records systems, some of which would impose considerable administrative problems to the medical profession, industry, and government. Some national and international groups are already studying the medical radiation exposure records problem, but little cooperative effort has been made with respect to the industrial radiation exposure records problem.

Recognizing the importance of this problem, the ASA committee at its first meeting decided to set up a subcommittee to develop a records system which would meet the requirements of all groups involved. This subcommittee is now being formulated and will have representatives from the fields of law, medicine, insurance, labor, Government, and private industry. It will be under the chairmanship of Mr A. R. Keene of the Hanford atomic plant.

The development of atomic energy legislation at all levels of Government has called attention to the problem of determining the competence of personnel doing professional work in the nuclear field. Already several governmental agencies and professional organizations have taken steps to develop qualifying procedures for nuclear professionals. The Bureau of Professional Licensing in Pennsylvania is now granting a professional engineering license in the field of nuclear engineering. The New York State Department of Health was authorized by the 1957 Legislature to set qualifications for "competent persons" in radiation protection work. The American Sanitary Engineering Intersociety Board is now issuing Certificates of Special Knowledge in Sanitary Engineering in the field of Radiation Hygiene and Hazard Control. Other groups are known to be working on similar qualification procedures. [2]

The American Nuclear Society, which is joint sponsor with The American Society of Mechanical Engineers of the ASA reactor safety project, has started work on seven projects on this same subject:

1. *Reactor Classification.* This project is under the direction of Mr U. M. Staebler of the Atomic Energy Commission. Several different schemes of classification are under consideration, and it is hoped that a standard scheme can be proposed for general study and eventual adoption.

2. *Reactor Environment.* This work is under the direction of Dr N. Hillberry, director, Argonne National Laboratory. The objective is to establish standards for such features as population (proximity, type, and density), meteorology, geology, type of container, proximity to roads, railroads, waterways, and other

[1] See page 233 for report of the second meeting of TC85. EDITOR

factors which are to be considered in selecting a suitable location for a reactor of a given type. The reactor environment is an important factor in any problem of external safety considerations—a concept which makes it necessary to define precisely what we mean by the "maximum credible accident."

3. *Reactor Operator Qualifications.* (Already discussed above).

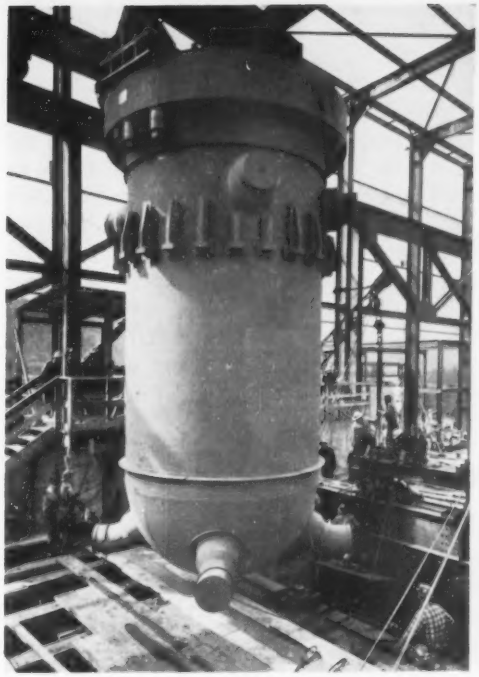
4. *Reactor Operations.* (Both projects, Nos. 3 and 4, are under the leadership of Dr Marvin Mann, AEC.) The purpose of these projects is to standardize local review boards, self-policing inspection, visitor rules, maintenance and repair permits, prestart-up checkouts, organization records, and other matters which affect the safety of reactor operation. These factors vary for the different types of reactor.

5. *Methods for Estimating Energy and Fission Product Release.* The work is under the direction of Dr M. C. Edlund, and has as its objective the establishment of standards for the estimation of the energy and fission products which are released in reactor accidents of various types. Standardization includes some basic assumptions, such as those made with respect to the probability of various types of accidents. It seems that for each new type of reactor, proposed or built, the methods of estimating the energy and fission products released from it will have to be reviewed separately. There are some types of reactors, however, several different examples of which are built, to which the same general rules and methods should apply as apply to all examples of this type.

6. *Reactor Dynamic System Design.* This project is headed by Dr M. M. Shapiro of the Nuclear Development Corporation. It is the objective of this project to establish standards with respect to the general design of the over-all reactor complex, taking into account such factors as interlocks, built-in safety, number of safety devices, degree of fail-safeness, etc. Since the whole dynamic reactor complex is under consideration, not only the reactor proper, but also the cooling system and control system, should be considered.

7. *Reactor Components.* The project is headed by Mr Ralph G. Chalker of Atomics International. The objective of this project is the establishment of components for reactor systems such as pumps, pressure vessels, piping, valves, power supplies, amplifiers, relays, etc. [3]

Urgently needed also are standards for the transportation of radioactive materials. Existing general regulations for the transport of dangerous materials have already been issued by the Bureau of Explosives and the Interstate Commerce Commission (ICC). The Coast Guard has issued its own regulations for water transportation of "explosives and other dangerous articles aboard vessels," and the Civil Aeronautics Administration of the U. S. Department of Commerce is responsible for the assurance of the highest degree of safety in aircraft. However, there have been no substantial changes made in the ICC regulations for radioactive materials since



ATOMIC reactor pressure vessel is here shown ready to be placed in reactor container at Shippingport plant. Vessel, now installed, houses uranium core, measures 33 feet from top to bottom, inside diameter 9 feet, weight 250 tons.

1948. There is a general feeling that the existing regulations have not kept pace with the many changes and improvements in techniques, terminology, and usage during the past ten years; the wording of the present regulations is out-moded and difficult to interpret. Some of the individual states have already recognized this and are formulating their own regulations.

Under the leadership of Mr F. Tighe, chairman of the Atomic Industrial Forum's Committee on Transportation, standards for the transportation of radioactive materials are under preparation. Very recently Mr Tighe pointed out the high cost of this transportation. For example, a 200-lb radioactive product must be shipped, for protective purposes, in a container weighing 28,000 pounds. In this case one pays freight charges of 99.6 percent for the container weight and only 0.4 percent for the weight of the product. One will easily understand that factors such as the aforementioned increase enormously the cost of nuclear power. This, and the matter of carrier liability in case of loss of or damage to radioactive material in shipment and permissible amount of shipment, are to be investigated. The AEC, ICC, and the Bureau of Explosives, must work together in order to solve these problems and to form standards for transportation. [4]

From the above we recognize that quite a lot of preparatory work for standardization is presently under way. Parts of the Glossary are already accepted as a standard, and many committees are working successfully on safety standards. However, with respect to the reactor components, it seems that we are still far away from standardization. How can we standardize the most expensive part in a reactor, the nuclear fuel,

as long as we have so many different types of fuels under consideration? We distinguish between solid and liquid fuels. The solid fuel may be uranium or uranium alloys in various degrees of enrichment, uranium compounds in a metal matrix, or ceramics. There are also a wide variety of solid fuel configurations under consideration: slugs, solid long rods, hollow long rods (tubes), flat plates, wires, pellets, perforated wafers, thin foils, spheres, and probably others. Why do we consider today such a variety of fuel configurations? The reason is that we scarcely try to improve the reactor economy.

Today's reactors are usually designed in the following way. The physicist makes all the calculations, and has no difficulty in making them, because he actually masters his field. The physicist then informs the reactor engineer that he wants a special fuel element, which should be of a certain shape and dimensions, have a long life, and be easy to reprocess. The reactor engineer has to develop the fuel element according to certain vague specifications of the physicist. This is, however, in my opinion, not the best way to develop a reactor. All the reactor proposals now being negotiated by the Commission are such that the fuel elements and spent fuels of no two will be alike. I seriously hope that the day may come when the reactor engineer will, independently from the physicist, develop an inexpensive fuel element design, with long life and easy to be reprocessed, around which element the physicist then will design the reactor. In other words, I seriously believe that any standardization of reactors using solid fuel elements should start with the fuel element. I am in perfect agreement, in this respect, with the similar ideas of Dr Louis H. Roddis, AEC's deputy director of reactor development, presented at the Fuel Element Technology meeting of the Atomic Industrial Forum in Cincinnati, in June of 1956, who said: "It is hoped we may soon reach the stage when thought will be given to building reactors (around) fuel elements which are already on the shelf, rather than creating new fuel elements at the last step in the reactor design process." This type of standardization of the fuel element is of prime importance; it will definitely permit a considerable cost reduction for nuclear reactors.

With respect to processing of active material, we do not have any standards at present, but every individual process has to be established first, or standardized, before anyone can get the AEC's permission to go into production. Active material is usually on loan from the Government. In order to obtain this material, one has first to find the best process as studied with nonactive material, to make a feasibility study and to submit a "feasibility report," which actually is a kind of freezing or standardization for the respective process using active material. This kind of standardization prevents the loss of the highly expensive active material or, if some loss cannot be avoided in the process, shows where the loss occurs, and permits recovery of the material after completion of the process.

After being used in the reactor, the fuel has to be reprocessed. By reprocessing we understand the chemical or metallurgical treatment of spent fuel in order to recover remaining fissionable material, while removing unwanted fission products which are produced during the use of the fuel in the reactor. The recovery and reprocessing of spent fuel is in many instances a most complicated process, of which several phases are still under security classification. What makes the procedure of reprocessing in general so difficult is the fact that we have so many different kinds of fuel, which have to be reprocessed in so many different ways. The preparation of fuel is, as has been pointed out above, still very expensive; however, the reprocessing and recovery procedure seems to be considerably more expensive in many cases.

If several nuclear power reactors, each using a different kind of fuel, are operating in geographically quite different locations, there are two possibilities for fuel reprocessing and recovery: each reactor may have its own recovery and reprocessing plant; or, the reprocessing and recovery plant may be centrally located. It is easily recognized that, in the first case, the relatively small scale reprocessing is expensive. In a centrally located plant the reprocessing is still expensive, as long as all the reactors are using different fuels, and one had to add to the reprocessing cost the expenses for fuel transportation and insurance during transportation. However, the expenses for reprocessing and recovery would be considerably smaller if the reactors around the recovery plant would use one and the same type of fuel. In this case the transportation and insurance costs would be tolerable, on account of the considerably smaller reprocessing costs. This is just one more example of why I believe that standardization of the fuel is of great importance and highly desirable.

Frankly speaking, I do not believe, however, that the moment will come soon where some standardization with respect to nuclear fuel and recovery will occur here in the United States. It might be possible that this kind of standardization will occur earlier and faster in some dictatorship-country, where the individual engineers and scientists are not permitted so much individualism as here in our country, and where also usually less funds are available for development work in so many different directions. I expect that in the dictatorship-countries there will be a development of lesser types of nuclear reactors and greater concentration on just a few types, pushing ahead of these types, in order to be the "first" in nuclear power production. Concentration on just a few types of reactors and going into production with these, however, permits and requires standardization.

Standardization may also progress faster in the western part of Europe, if the idea should develop that the fuel be fabricated and recovered by an international producer, delivering fuel and reprocessing it for the various nations. This larger scale production

could result in considerably lower fuel costs than the relatively small-scale separate fuel production by individual countries. This international fuel production, however, requires at least partial standardization of fuel, and I can envision that standardization in the nuclear industry will make faster progress in foreign countries than in our country.

Another reason for this belief, that standardization will start earlier in foreign countries, is the fact that some of these countries are in much more urgent need of nuclear power reactors than we are here in the United States. During my recent trip to Switzerland, I was informed that the hydropower in Switzerland will be sufficient only for the next 10 to 15 years, and then Switzerland will urgently need nuclear power because of its complete lack of coal and oil. This is correct also for several other foreign countries. We here in the United States will still have, for at least 60 to 80 years or longer, enough hydropower, natural gas, coal, and oil to satisfy our steadily increasing power requirements without application of nuclear processes.

Another reason why I believe that nuclear reactors are, at least at present, of greater interest in foreign countries than in our country lies in the fact that precisely the same reactor which is still uneconomical in our country because of our low power prices will be an economical reactor in foreign countries with the usually considerably higher power prices. I will even go so far as to make the statement that nuclear power reactors for public utility uses, which are so urgently needed in many foreign countries, are still a luxury item in our country—at least for the present.

All these ideas, however, are valid only for the stationary nuclear power reactor and are not necessarily applicable for aircraft, submarine, and other Navy reactors. They may not be valid in connection with any nuclear reactor to be used for national defense purposes.

The need for standardization, or at least for accurate specifications, was evident in one of the foreign countries, where thinking in nuclear engineering is fairly well advanced. In this country the fuel elements were ordered from the government of another country, and the orders were given by the physicist in charge of the project. The specifications hardly mentioned anything more than the dimension of the elements. When the fuel was delivered, the dimensions were found to be perfect; however, the other physical properties, such as the density, mechanical and structural properties, were such that the engineers were not able to use this fuel in the reactor. Precise specifications, as a first step to standardization, are an urgent "must" in the nuclear industry.

I do not think that we have to be afraid that in our country standardization in nuclear engineering will occur at too early a stage of development. Premature standardization, however, as everyone knows, has certain disadvantages. I remember an example which occurred during World War I, which was discussed at the Institution of Civil Engineers in London: "It is a curious thing," the speaker noted, "that we have gained in some respects by delaying wide and general standardization of aircraft materials, and the Germans, by precipitately standardizing in the early stages, although they may have had considerable advantage at the time, have, at the present moment, entered upon a period in which they may well be hampered by the over-standardization in which they have indulged." The address was delivered by the then Minister of Munitions, Winston Churchill.

This is the present situation is the field of standardization in nuclear engineering. We are far away from just a few types of standardized reactors; however, the time will come when we are ready for complete standardization. This will be the time when nuclear power reactors will become economically feasible and when the nuclear reactor industry will be as great as is desired today. Just when this time will come, nobody knows.

REFERENCES

1. McAdams, W. A., "General and Administrative Standards," *Paper* 57-AIF-61, "The 1957 Nuclear Industry—Problems and Progress." Atomic Industrial Forum, October 1957.
2. Williams, C. R., "International Standardization Activities in the Field of Nuclear Energy," *Paper* 57-AIF-60, "The 1957 Nuclear Industry—Problems and Progress." Atomic Industrial Forum, October 1957.
3. Leverett, M. C., "Standards Activities in the American Nuclear Society," *Paper* 57-AIF-63, "The 1957 Nuclear Industry — Problems and Progress." Atomic Industrial Forum, October 1957.
4. Tighe, F., "Are Transportation Standards Needed in the Atomic Industry," *Paper* 57-AIF-65, "The 1957 Nuclear Industry — Problems and Progress." Atomic Industrial Forum, October 1957.

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Tool Engineers Stress Standards

Standards had a prominent role in the American Society of Tool Engineers' annual meeting at Philadelphia, May 1-8, 1958. H. Thomas Hallowell, Jr, president of the Standard Pressed Steel Company, and president of the American Standards Association, presented the keynote address (see excerpts below). Theme of the meeting was "Tooling for Competition." An outstanding paper of the meeting was "Standardization in the Nuclear Industry," presented by Dr Henry Hausner at the session on Nuclear Engineering. Dr Hausner's paper is published by special permission in this issue (page 225).

H. Thomas Hallowell, Jr, president of Standard Pressed Steel Company, and ASA's president, used reliability as theme of keynote address at ASTE meeting.

A high-power attendance of ASTE members, with high company officials predominating, marked the meeting as one having special importance.

As one of the technical features, the ASTE National Standards Committee sponsored a panel discussion on "Creative Standardization." Samuel H. Watson, manager, Corporate Standardizing Division, Radio Corporation of America, was moderator. Members of the panel were Dr Allen V. Astin, director, National Bureau of Standards, U.S. Department of Commerce; W. L. Budge, manager of sales, Atomic Power Activity, Westinghouse Electric Corporation; Roy Trowbridge, director of engineering standards, General Motors Corporation; and Leo B. Moore, associate professor of industrial management, Massachusetts Institute of Technology.

Mr Trowbridge, as the exponent of industrial standards, discussed mainly how standards fit into the General Motors design engineering group. He stated that it was the policy of General Motors to hand the entire engineering package over to the standards group as soon as the designs are firmed. It is the function of the standardizing group to create standards to which these parts will be made and to select the materials and tolerances for the finished articles.

Mr Budge of Westinghouse, as exponent of specialized industry standards, discussed briefly the problems that are faced by the manufacturing group in the atomic energy programs. As there are no accepted standards on the manufacture of components still on the design board, standards have to be created before the project is begun, he said. He cited numerous examples such as reactors and also talked on safety standards necessary when programs are concerned with the handling of radioactive materials. Each component for the various reactors or power plants must be designed separately as the problems faced for each plant layout are entirely different. His discussion indicated how complex standards will be for building even a single item.

Dr Astin, exponent of national standards, spoke on the facets of the National Bureau of Standards and how his program applies to the over-all standardization projects in this country. He discussed the present program on "inch measurement" and was asked whether or not the United States should or might adopt a metric system. His answer was rather startling—that the pressure of world trade might be influential as to whether or not we would adopt a metric system. He pointed out that Japan, Red China, and Russia have all formally adopted the metric system very recently.

The problems that must be faced in providing the necessary education and background for students concerned with industrial standardization were discussed by Professor Moore of MIT. He dealt mainly with the gray areas where standards mix economics and English. Most provocative was his idea of trying to establish a course that will make standards a basic element of communication between individuals.

The American Society of Tool Engineers now has a total of 150 Senior Chapters and 20 Student Chapters. The chapters are located in the United States, Canada, and Australia. ASTE maintains liaison representatives to the American Standards Association, the Canadian Standards Association, and the Standards Association of Australia. The ASTE liaison representative to the Canadian Standards Association is also the CSA representative to the ASTE.

New officers installed during the ASTE meeting are George A. Goodwin, works manager of the Master Electric Company, Dayton, Ohio, *president;* Wayne

Ewing, Los Angeles, California, *first vice-president;* H. Dale Long, Chicago, Illinois, *second vice-president;* William Moreland, Ashland, Ohio, *third vice-president;* David A. Schrom, York, Pennsylvania, *fourth vice-president;* Philip Marsilius, Bridgeport, Connecticut, *treasurer;* and Charles Smillie, Detroit, Michigan, *secretary.*

In his keynote speech "Reliability Requirements for Tomorrow's Competition," Mr Hallowell challenged industry to make "reliability" a new way of life in industrial America.

"Reliability must start with the tools and components we use and carry through our production at all levels, in all places," Mr Hallowell said. "Our future progress will depend on your attitude as a tool engineer in conceiving, designing, tooling, and building reliable products. Our future production must outperform today's in all respects and we still must turn out goods at a cost the consumer can afford to pay."

"Too often," Mr Hallowell declared, "production-line thinking is primarily concerned with the cost factor, while satisfactory product performance is neglected. The American consumer is now stuck with a $20 billion a year repair bill. He is beginning to rebel, to demand reliable products—and I don't blame him."

Mr Hallowell listed the components of a simple die in a punch press to emphasize his point that "the reliability of your production setup is the multiplication product of the individual reliability factors of each of the components which are found in the operation."

"If the individual component reliability factors of each of these terms are as high as 99.44 percent, and if there are 410 parts, the press will work satisfactorily on only 10 out of 100 tries," he declared. "If as few as 100 total parts are used, and if each part is 99 percent reliable, then the chances of satisfactory performance will be 36 out of 100."

"We've been lucky," he said, "but, as things get more complicated and more expensive, our chances of failing are rapidly increasing. Little things are becoming much more important because everything must perform, or our whole operation stops."

As a means of solving this problem, Mr Hallowell suggested letting the competitive facts of life be known to suppliers. "Insist that you secure from your outside suppliers of raw materials, parts, and components, the standards of size, interchangeability, finish, quality, and reliability required," he said.

"You can no longer afford to accept the inferior reliability standards of the lowest-quality producer in an industry. Using inferior purchased parts and raw material is a reliable way of building unreliability into your product."

As for standards, Mr Hallowell urged that companies take an increasingly active part in standards work. It is much more economical, he declared, to build up a production unit out of "standard building blocks" wherever possible, thus taking maximum economic advantage of the combined past experience and reliability that have been written into any standard.

"Now is the time," Mr Hallowell declared, "during this economic breathing spell of 1958, to realize the unbelievable opportunities that lie ahead. Demands in the 1960's will require more and better products with greater reliability, and produced in the most economical manner, using minimum effort."

International Committee Charts Program

SIXTY-EIGHT delegates from 17 countries attended the second meeting of ISO Technical Committee 85 on Nuclear Energy and its subcommittees at Harrogate, England, June 9-20. Observers were present from two other countries, and representatives of six international organizations attended.[1]

Morehead Patterson, chairman of the Board of the American Machine and Foundry Company, USA, and chairman of ASA's Nuclear Standards Board, served as chairman.

Three subcommittees are now active: Subcommittee 1, Terminology, Definitions, Units, and Symbols, with USA as Secretariat; Subcommittee 2, Radiation Protection, with France as Secretariat; and Subcommittee 3, Reactor Safety, with the United Kingdom as Secretariat.

A fourth subcommittee was organized at the meeting, to develop international recommendations on radioisotopes, with Poland holding the Secretariat.

All three of the active subcommittees arrived at agreements as a basis for their future work. The basic design of a symbol for international use in denoting the actual or potential presence of ionizing radiation was given serious consideration by Subcommittee 1. The subcommittee's problem was complicated by the fact that several symbols are already in use. One of these is the

[1] The following were represented at the TC85 meeting: Belgium, Brazil, France, Germany, Hungary, Ireland, Israel, Italy, Japan, Netherlands, Poland, Roumania, Sweden, Switzerland, United Kingdom, USA, USSR. Observers were present from Burma and New Zealand. Representatives were also present from the International Commission on Radiological Protection (ICRP), the International Commission on Radiological Units and Measurements (ICRU), the International Atomic Energy Agency (IAEA), International Electrotechnical Commission (IEC), the United Nations Educational, Scientific, and Cultural Organization (UNESCO), and the World Health Organization (WHO).

three-bladed symbol used in the United States by the Atomic Energy Commission, and recognized as standard in the new American Standard Safe Design and Use of Industrial Beta-Ray Sources, Z54.2-1958. Another is the symbol adopted by the International Labor Organization. W. A. MacAdams, chairman of ASA Sectional Committee N2 on General and Administrative Standards, was assigned the task of submitting a number of designs for consideration by the subcommittee.

Subcommittee 1 also took first steps toward preparation of an international glossary of nuclear terms and selected a tentative list of 223 concepts to be defined.

Subcommittee 2 on Radiation Protection has before it three outline drafts concerned with the indirect contamination of individuals and with radiation detectors, as a basis for its future work.

Subcommittee 3 on Reactor Safety defined the extent of its interest in radiation measurements, health records, and effluent discharge. It did so keeping in mind the interest of a number of other international organizations in these same subjects. Specifically concerned are the International Atomic Energy Agency, the International Commission for Radiation Protection, the International Commission on Radiological Units, and the World Health Organization.

The subcommittee also expressed its opinion that work on potentially critical accumulations of material connected with processes other than reactor operation should be undertaken.

Eleven items connected with reactor safety were selected for work by Subcommittee 3 and the subcommittee's procedure for the work was outlined. These eleven items are: meteorological aspects; siting of reactors; qualifications required by operating personnel; handling of material from the reactor core and blanket; containment; reactivity status; heat removal and coolance; irradiation effects on materials of construction; stresses in materials of construction; safety device for reactor shutdown; evaluation reports.

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INDUSTRIAL CONFORMITY

It Can Help Bring More World Trade

AS THE father of mass production, U.S. business pioneered in standardizing thousands of parts and products to spur sales and cut costs. It set up specifications, for example, so that a light bulb would fit the socket no matter who made it. But while showing the world the benefits of standardization, U.S. firms have done a poor job in helping set up worldwide standards. They have left the field largely to other nations, simply because many U.S. businessmen are unaware of the importance such standards play in world trade. This importance was emphasized last week as 1,000 delegates from 40 countries met at Harrogate, England, to bring the world closer to conformity on everything from screw threads to nuclear reactors. Eventually, their decisions will have repercussions from the board rooms of Krupp to the Kremlin, affect housewives from Minneapolis to Vladivostok.

The need for international standards was recognized 50 years ago but did not attract worldwide attention until World War II. In 1947, shortly after the International Organization of Standardization was formed, doctors discovered that an order of Swedish hypodermic needles rushed to epidemic-stricken Egypt did not fit U.S. syringes in use there. Needles to fit eventually arrived—but not until hundreds of victims had died of cholera. Since then, the organization, working through scores of national standards groups, has approved 58 worldwide standards for everything from musical pitch to the abrasion resistance of rubber.

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U.S. firms have often taken notice of international standards only when they were being hurt. The U.S. movie industry fought for and got an international film standard based on U.S. standards (with the sound track on the left edge of the film as it goes through a projector) only after the Germans ate into its foreign markets and threatened to establish German standards with the sound track on the other side. Result: U.S. movie companies can distribute worldwide, get 50% of their income from abroad.

Though U.S. firms, in a belated awakening, sent 60 delegates to Harrogate, they have taken the lead in developing only nine world standards. They have not worked at all on 58 of the 142 draft recommendations for standards now being considered, including standards for such big export items as steel and textile machinery. Many standards may therefore be set up contrary to U.S. design, shutting U.S. goods out of nations that adopt them as effectively as do high tariffs, currency restrictions or import quotas.

Since U.S. industrial technology leads the world, many nations could easily be persuaded to adopt U.S. standards as international, thus open up new markets for U.S. products. But while U.S. businessmen have dallied, the world has not waited. Great Britain, France and The Netherlands have taken the lead in standard setting, and even Russia has participated in one-third more standardization conferences than the U.S. Young industrial nations are already finding it easier to adopt British, French or even Russian rather than U.S. standards. In the last ten years, India has adopted some 1,000 national standards; most were British, only a few American.

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U.S. industry has not even taken the trouble—or spent the money—to have its 1,700 national standards translated for use in foreign countries. In Latin America, where the U.S. is the biggest trader, few standards exist. But it is European businessmen instead of U.S. firms who are translating their standards into Spanish and Portuguese in a drive to grab a bigger slice of its growing market.

U.S. firms have already been hurt by not taking part in fixing worldwide standards. They ignored international proposals to govern the size of grooved pulleys and V-belts, later found that the standards adopted were detrimental to U.S. products. Now the U.S., through its American Standards Association, is vainly trying to have the recommendation changed. American businessmen did not participate in discussions for uniform cast-iron pipe specifications, stood back while standards were approved that do not mesh with those in the U.S. Result: U.S. industry has lost business, especially in South America. A major U.S. pipe company recently could not fill an order to Venezuela, for example, because of the difference in specifications.

Most U.S. companies, geared to big production, cannot profitably change their products to meet foreign standards for export orders. But smaller foreign companies often find it worthwhile to change their products to conform to U.S. standards so that they can go after the big U.S. market. Said H. Thomas Hallowell Jr., president of the American Standards Association: "It is no coincidence that American industries doing the largest export business—the electrical and motion-picture industries, for example—are the ones that have helped develop international standards."

A Delegate Reports on Small Tools

by **Frank P. Brown**

MR BROWN is head of the Shops Division, National Bureau of Standards. He was the American Standards Association's delegate at the meeting of ISO Technical Committee 29 on Small Tools, April 21 through April 24, 1958, at Berlin, Germany. He also attended meetings of Working Group 4, Screwing Taps, and discussed mutual problems with the chairman of Working Group 2, Twist Drills, presenting copies of American Standards on Twist Drills for consideration by the Group.

On June 30, 1958, *Time* magazine published an article entitled "Industrial Conformity—It Can Help Bring More World Trade." It was a telling argument, urging greater participation by U.S. industry in the work of the International Organization for Standardization, not for the sake of better international relations, but for the sake of American industry itself.

As a delegate representing the USA at a meeting of one of the ISO committees, I saw at first hand what *Time* was talking about.

Technical Committee 29 is the international committee working on small tools. The national standards organizations of 18 countries are members.[1] It is an active committee, with 18 working groups developing detailed recommendations on specific small tool problems. Some of these groups include twist drills, files and rasps, reamers, shank diameters, screwing taps, turning tools with carbide tips, drill chuck tapers, and milling cutters. Although American industry is officially participating in the work of Technical Committee 29 through the American Standards Association, it has taken no active part in the work, and is not a participating member of any of the Working Groups. This year USA had a representative at the plenary meeting of TC 29, and at the same time, arrangements were made for the USA representative to attend the meeting of Working Group 4 on Screwing Taps.

As the USA delegate, I found these meetings offered an unusually interesting experience. National standards organizations of 12 countries were represented during at least some of the sessions of the main committee: Austria, France, Germany, Hungary, Italy, The Netherlands, Poland, Sweden, Switzerland, United Kingdom, United States, and USSR.

All these delegates showed unusual interest and earnestness in attempting to achieve international agreements on technical problems. They expressed an obviously genuine desire that the USA (the American Standards Association) participate actively in the plenary meetings of the Technical Committee and also in the several working groups.

From the viewpoint of American industry's own interests it would be desirable that we participate more actively for a number of reasons:

1. It should stimulate the sale of tools on the European market that are manufactured by American plants located abroad as well as in the USA.
2. It should reduce the possibility of the adoption of ISO standards which might result in a diminishing export market for the United States.
3. In participating, the United States would lend emphasis to the incorporation of English measurement units in ISO/TC 29 standards. Strong pressure toward the use of metric units is currently evident.
4. It would assist in dispelling an attitude of aloofness which some of the countries apparently feel the U.S. exhibits in not actively participating in ISO/TC 29 work. From a national standpoint, more active participation is desirable during this period of tension.
5. Appropriate representation would give the opportunity to present the American viewpoint on international standards in a personal manner resulting in better understanding of such viewpoints by the European people. It would also serve to keep our industry up to date on what is going on in other countries and thus provide broader over-all viewpoints and mutual understanding.

[1] Austria, Belgium, Canada, France (Secretariat), Germany, Hungary, India, Italy, Netherlands, Norway, Poland, Portugal, Switzerland, Sweden, Czechoslovakia, United Kingdom, USA, USSR.

If we do establish a more active policy of participation, we can benefit by selecting our delegation carefully with the needs of the job in mind. Delegations from other countries follow an established technique in organizing their delegations. The USA could benefit from a study of this technique with a view to applying it ourselves.

First, the chief delegate or chairman of the group chosen to represent ASA should have certain qualifications. He should be a good administrator, but also he should be a person who has a broad over-all acquaintance with small tools and who is not limited by a close professional interest from either a producer or consumer viewpoint. Although translation facilities are made available by the Secretariat during meetings, the secretary of the USA delegation should have the ability to translate readily from French to English if the delegation is to take an effective part in the committee's work. For this purpose, a general knowledge of French is not sufficient without a fairly good knowledge of French terms relating to tools. This is particularly important since the secretariat of TC 29 is held by the French Standards Association and most of the preliminary documents circulated for study and comment between meetings are issued in French.

At the plenary meeting of Technical Committee 29 in Berlin, a number of draft proposals were approved as Draft ISO Recommendations. These will now be submitted to the ISO General Secretary for circulation to all ISO member-bodies. If they are approved by 60 percent of ISO member-bodies, they will be sent to the ISO Council for approval as ISO Recommendations. These ISO Recommendations are what their name implies. They are recommendations to the national standards bodies of the various countries for possible adoption or incorporation in their national standards, with the view to bringing about greater uniformity of practice.

Draft ISO Recommendations were approved by the committee on the following: Files and rasps; reduction sleeves and extension sockets for tools with Morse tapers; twist drills; reamers; shank diameters and driving squares for tools; sections and tolerances of shanks for turning and planing tools; carbide tips for turning tools, metric sizes; turning tools with carbide tips, metric sizes; drill chuck tapers.

Technical Committee 29 also authorized a number of the groups to take up additional work. Clearer definitions of the shapes of files are to be developed by the Working Group on Files and Rasps. Also, further simplification is to be studied, as well as the possibility of reducing the minus tolerances in order to facilitate resharpening of files.

The Working Group on Twist Drills will add to its program a study of the choice of drill diameters in relation to usage.

Each of the members of the Working Group on Shank Diameters and Driving Squares for Tools agreed to impress on interested manufacturers in his country the need to put the ISO Recommendation into effect quickly as soon as it is given final approval.

A draft proposal based on British and American Standards is being prepared by the Working Group on Screwing Dies.

A preliminary table of general dimensions of taps for conical threads was circulated to members of the Working Group on Taps for Pipe Threads. This table was prepared by the British Standards Institution's Committee on Fastening Threads, and applies to fastening threads covered in British Standard 2779:1956 and British Standard 21:1957. It was pointed out that in British Standard 21:1957, two systems of gaging are included, one in accordance with current American practice, and the other following the British practice.

Technical Committee 29 is asking inch-using countries either to adopt the Draft ISO Recommendation on Carbide Tips for Turning Tools, Metric Sizes, when converted into inches with sufficient precision to ensure practical interchangeability, or on the contrary, to adopt dimensions and denominations quite different in order to avoid risk of confusion.

Working Group 4 on Screwing Taps will collect information from members on current practices regarding tolerances on threads of screwing taps. This working group has approved marks for taps to show tolerance of tap thread, indication of the left-hand thread, and the order in which serial taps are to be used. The type of steel is to be marked at present in accordance with the practice in each country. ISO Technical Committee 37 is preparing recommendations on terminology and may recommend symbols for different types of tool steels. Working Group 4 will wait for action by TC 37.

A new investigation will be carried out by Working Group 10 on Milling Cutters under the auspices of Technical Committee 29 to try to find close agreement between the inch and metric values on the average of outside diameters.

All of this activity on the part of Technical Committee 29 and its working groups has been reported to the Steering Committee of Sectional Committee B5 on Small Tools and Machine Tool Elements and it is understood it will be presented at the next meeting of Committee B5. The report includes the recommendation that the committee make arrangements to work more closely with TC 29. Particularly, it is recommended that the committee arrange to have representation at future meetings of Technical Committee 29 and as many of its working groups as possible.

Ninth National Conference on Standards

Hotel Roosevelt, New York
November 18, 19, 20, 1958

Where International Cooperation Succeeds

by **J. M. Bryant**

IN contrast to ISO projects where the United States has either failed to recognize the importance of participation (see *Time* article reprinted on page 234) or failed to live up to the pledge of cooperation once the formal step to participate is taken, the project ISO/TC4, Ball and Roller Bearings, stands as an example of how these ISO programs for standardization might work.

Next December will mark the tenth anniversary of U.S. participation in ISO/TC4. By that time the committee will have seen the following prima facie evidence of their progress: ISO Recommendation 15, Ball and Roller Bearings; Draft ISO Recommendation 116, Methods of Evaluating Static Load Ratings; Draft ISO Recommendation 154, Boundary Dimensions; Draft ISO Recommendation 155, Accessories; Draft ISO Recommendation 156, Tolerances.

As outlined later in this article, other proposals have just been completed and they will be added to the list.

The manufacturers, through the Anti-Friction Bearing Manufacturers Association, have been the driving force behind the U.S. participation. They have funnelled their opinions as prepared by the Annular Bearing Engineering Committee and the Roller Bearing Engineering Committee into Sectional Committee B3 where all national organizations concerned with bearings discuss and approve the opinions for presentation into ISO/TC4.

A well prepared delegation represented the USA at the meeting of ISO/TC4 (Secretariat, Sweden) at Naples, Italy, June 3-7, 1958.

The delegation went to the meeting prepared with proposed American Standards on a number of subjects under discussion and with well-developed American viewpoints on others. The delegation was well pleased with the results of the meeting. All the preliminary work done by the groups concerned in this country, particularly the Annular Bearing Engineering Committee and the Roller Bearing Engineering Committee of the Anti-Friction Bearing Manufacturers Association, and ASA Sectional Committee B3 on Ball and Roller Bearings, had cleared the way to such an extent that most of the proposals made by the American delegation were accepted by the technical committee.

Specifically, as the result of work done by Working Group 1, Bearing Identification Code, Technical Committee 4 gave unanimous approval of the USA draft proposal on which ABEC, RBEC, and Sectional Committee B54 had voted before the delegates went to Europe. B54 is a sectional committee devoted exclusively to the development of a bearing identification code in the U.S. This proposal is substantially in agreement with the proposed American Standard completed under the sponsorship of AFBMA.

Working Group 1 of TC4 is now charged with the responsibility of keeping the Identification Bearing Code up to date and developing additional material as may be suggested in other meetings. One of the subjects on which additional work may be required is that of heat stabilization. Plans are also under way to establish codes for inch-dimensioned tapered roller bearings and for instrument bearings of both inch and metric series. Undoubtedly it will be some time before anything specific is accomplished but correspondence among the members will clear the way in the interim.

As a result of the work done by Working Group 3, Load Ratings, TC4 also accepted the American proposal on dynamic load ratings for radial and thrust ball bearings, although this time with a majority vote, not unanimously. The American proposal specifies an f_c factor for each of the different types of bearings. The ISO proposal established an average f_c factor based on all of these types of bearings. Some sympathy toward the American proposal was expressed by several of the other delegates.

Working Group 4, Tolerances, recommended approval by ISO/TC4 of an extension of the tables of tolerances on radial bearings. This recommendation was accepted by the technical committee, and the extension was approved. Also, the committee accepted the definition on radial run-out and method of checking developed by the AFBMA which is expected to be included in a proposed revision of American Standard B3.5-1951.

Tolerances for Ball and Roller Bearings. Committee B3 had started work on a revision more than a year ago, but is planning to adopt any provisions agreed on internationally before the final draft of the revision is completed.

This procedure, incidentally, is the preferred way of coordinating international standardization with national standardization. When an international proposal has been accepted, the corresponding American Standard should be modified to be in agreement with the international work, if possible. This method is in contrast to that whereby an American Standard would be finally approved before international agreement on an ISO recommendation and the door closed to possible minor modifications or changes.

Other USA proposals that were approved by the committee included the AFBMA method of checking for groove run-out with reference side, the tolerances for metric series bearings in bore, outside diameter and width, and the method of checking the internal axial clearance of self-aligning bearings and the recommended rotation of outer ring during the check.

Working Group 5, Tapered Roller Bearings, has decided to establish a general boundary plan for the metric series of tapered roller bearings. At least one restriction has been placed on the development of the plan. The group was instructed by ISO/TC4 to delete tapered roller bearings larger than 110mm bore in the dimension series 02, and larger than 95mm bore in the dimension series 03. This was done because of the very poor proportions that were obtained as a result of the narrow widths.

The inch series of dimensions for tapered roller bearings submitted by the American group was approved by Technical Committee 4.

It was decided, following discussion, that in all tabulated data both the inch and metric dimensions will be included. This will provide a conversion to help the user in relating one dimension to the other without the usual complication of applying a conversion factor to each dimension as has been necessary in the past.

Working Group 6, Instrument Bearings, is just getting started and no action was taken by Technical Committee 4 other than to approve the approach the committee is making in considering the different proposals that have been submitted. A USA proposal and a proposal from Switzerland are now before the committee. In addition, a number of proposals have been sent in by other countries in respect to metric bearings, but these were not discussed since only those items that have been in the hands of the delegates for at least four months before the meeting can be considered. Correspondence will be carried on in order to prepare the proposals for action at the TC4 meeting in Berlin in 1959.

Subcommittee 3, Airframe Bearings, had before it a proposal based on USA standards for airframe bearings and another submitted by France in metric dimensions. However, again action could not be taken on them at this meeting. Certain points in the two documents were combined, and they were put before the delegates for consideration.

Technical Committee 4 has decided to designate as "separate thrust collars" what in the USA is called "separate thrust shoulders." The committee was of the opinion that the term "shoulder" can be confused with other terminology used in the code. The USA delegation could see no objection.

Before the next meeting of the committee a number of proposals will be studied. Among these is a proposal presented by Dr Hilding Törnebohm of Sweden concerning measuring bores and fitting practice. Another is a study of methods of clearance measurement submitted by Italy and Russia.

A third is a proposal concerning needle bearings presented by France. The French proposal is in metric dimensions; in the USA the bearings are in the inch series. If the USA desires to have inch needle bearings recognized at the international level, a proposal should be submitted to the Secretariat by May 1, 1959, in time for action at the meeting of TC4 next year.

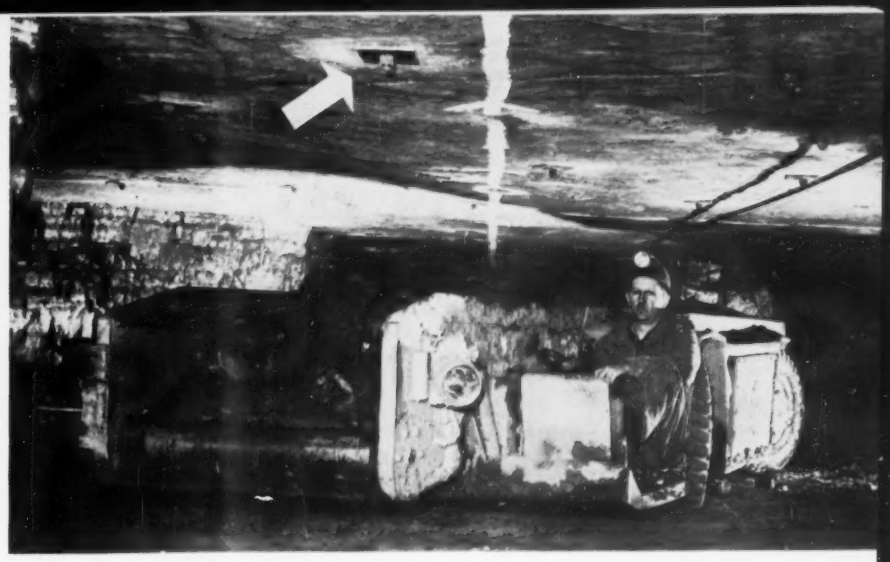
Technical Committee 4 decided, on the other hand, not to consider the method of measurement for acceptance and inspection of bearings as requested by Hungary. Nor will it deal, at the present time, with noise, vibration, tolerances for taper bore 1:12 for bearings larger than 520mm, tolerances for radial bearings, classes 6 and 5, for bores larger than heretofore considered, and finally, will not consider tolerances for taper bore 1:30.

It seemed obvious to the USA delegates that action by the ISO committee depends very largely on the effectiveness of the correspondence that has been carried on before the meeting. The delegates recommend that the USA viewpoints be circulated to all members of the working groups and the technical committee in the interim period before a meeting so that no delegation goes to a meeting having failed to carry on correspondence on a subject in which USA is interested.

Some 80 delegates from 18 countries attended the meeting of Technical Committee 4. A representative of the International Union of Railways was also present.

The following delegates attended from the USA: J. M. Bryant, chief engineer, Ball and Roller Bearing Division, Link-Belt Company, Indianapolis, Indiana; Gunnar Palmgren, vice-president in charge of engineering and research, SKF Industries, Inc, Philadelphia, Pennsylvania; T. E. Rounds, vice-president, The Barden Corporation, Danbury, Connecticut; H. O. Smith, secretary-manager, The Anti-Friction Bearing Manufacturers Association, Inc, New York, N. Y.; H. D. Stover, standards and patent engineer, Timken Roller Bearing Company, Canton, Ohio.

Present as U.S. observers were: H. R. Slusser, consulting engineer; and H. J. Urbach, executive engineer, Timken Roller Bearing Company; and J. W. McNair, technical director, American Standards Association.



STANDARDS HELP SUPPORT MINE ROOF

by **George W. Sall**

MR SALL, mechanization engineer, American Mining Congress, is an alternate representative for the Congress on the Mining Standards Board of the American Standards Association. The American Standard Specifications for Roof Bolting Materials in Coal Mines, M30.1-1957, about which Mr Sall is writing, was submitted to the American Standards Association for approval as an Existing Standard with the American Mining Congress serving as Proprietary Sponsor. Copies of the standard can be obtained from ASA at 50 cents each.

It is doubtful that any one advance in technology since the invention of the steam engine has had the immediate impact that roof bolting has had on the mining industry. In ten short years this method of roof support has grown from an experiment in an Illinois coal mine to the point where over four million roof bolts are used per month in the coal, metal, and nonmetallic mines in the United States. At a bolt cost of one dollar apiece, this amounts to a $50 million a year business in bolts alone. While by many standards this is not a large business, there is no question that it is a lot of nuts and bolts.

The support of mine roof is vitally important to any mining man. His livelihood, and in all too many cases his very life, depend on keeping the roof in place. Despite all the publicity attending a mine explosion in which 100 men are killed, historically roof falls account for one-half to two-thirds of all coal mine fatalities, and about one-third—the largest single cause—of fatal underground injuries in metal and nonmetallic mines. Falls of roof also cause the largest number of serious nonfatal injuries in our nation's mines.

Traditionally, roof support in the mining industry has been achieved through the use of timber. Wooden posts were used to "prop" up the roof, or to support cross timbers which in turn carried the roof load. In other cases wooden "cribs" were used to shore up the "top." Sometimes metal replaced the timber, but the principle was the same. These were the common methods used in supporting roof loads until ten years ago—methods that had changed little in the annals of mining.

Then word began to spread through the industry that at a coal mine in central Illinois surprising results were being achieved by drilling six-foot holes into the mine roof, anchoring 1-inch bolts at the top of the hole and tightening a 2 by 12 by 12-inch oak washer against the roof. Results were surprising in that a roof which was difficult to support with timber now stood with no support other than the bolts.

The possibilities of this unique method of roof support were tremendous and challenged the imagination of the mining industry. Timber posts and crossbars were always being knocked down by moving equipment and, if the timber pieces did not do damage in themselves, the unsupported top posed a dire threat. The movement of timber from the surface to the working area offered certain problems in logistics. Travelways that had to be used for long periods of time needed to be retimbered as the original timbers rotted out. Then, too, timbering, which is a hand job, often was the bottleneck to production in an industry that was seizing upon every possible means of mechanization to cut costs and increase efficiency.

At first there was all kinds of speculation on how and why roof bolts worked. However, the U.S. Bureau

of Mines and many others who saw the potentials of the newly-found method of roof support concentrated on various facets of the problem and came forth with two general theories that have become accepted.

Coal mine roof rock is commonly a sedimentary deposit and is laminated in varying degrees. It is felt that in roof of this type the action of a bolt is to bind the laminae together into a solid beam type structure.

One way to visualize this is to consider a stack of 1 by 8-inch by 18-foot boards supported at each end by a saw horse. There will be a definite sag in this loosely laminated beam—sag that in mine roof would mean broken strata and falling rock. However, if the stack of boards is solidly clamped together, the boards are bound into a solid beam with much less, if any, sag. Translated into mine roof this means no roof sag, no broken strata, no roof falls.

Roof material that is unconsolidated or poorly laminated is secured in another way. The same bolts are used, but in this case they are anchored in a strong stratum above the weak mine top—the immediate roof being suspended from the stronger layer.

Strange as it may seem, the earliest use of roof bolts, or suspension rods as they were first called, is lost in antiquity. It is a matter of record that they were used in the lead and limestone mines of southeast Missouri 30 years ago. There is good reason to believe that bolts were tried as a means of supporting roof in the Pocahontas coal fields of southern West Virginia 50 years ago. Other authorities believe that European coal miners should get the honor of introducing this unique method of roof control at the turn of the century. For all practical purposes, however, roof bolting can be

TABLE I	*Tensile Strength psi*	*Yield Point psi*	*Elongation, min in 8-in gage length*
Regular-Strength Headed or Slotted Bolts	60,000 min	30,000 min	17 percent
High-Strength Bolts	80,000 min	40,000 min	12 percent

TABLE I—Required tensile properties for bars from which roof bolts are made.

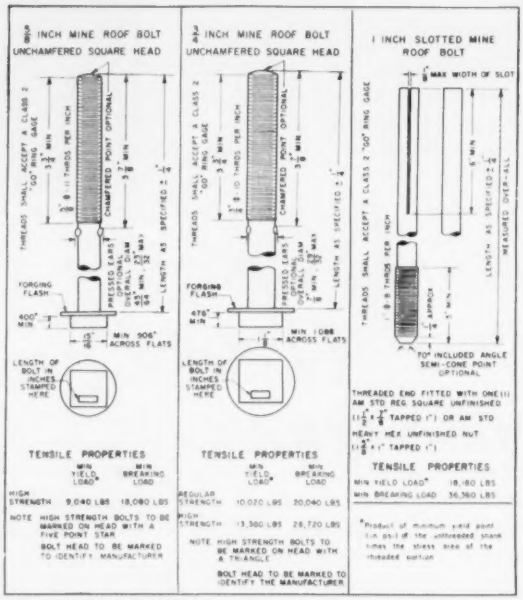


Figure 1—Basic dimensions for ⅜-inch and ¾-inch square-headed roof bolts and one-inch slotted bolts.

Roof bolts have replaced timber in the back part of this coal mine opening. Note roof is fractured above crossbars in top foreground.

Photo—Bureau of Mines
US Department of the Interior

Old-style method of supporting mine roof shows pillars in use during undercutting operation in coal mine.

Photo—Sullivan Machinery Co

considered as having its birth, or rebirth if you wish, in 1948.

It was indeed a healthy child that was born. According to the U.S. Bureau of Mines, in 1949 virtually all of the mechanized coal mines in the United States were either planning experimental installations or were preparing to "jump head-first" into roof bolting.

The metal and nonmetallic mining industries were not far behind their coal mining cousins in adopting roof bolts wherever they could. And right in back of them came the tunnel drivers. The latter group had a secondary interest in roof bolts. Since most tunnels are lined when completed, the use of bolts allowed the driving of a smaller cross section than was the case when an allowance had to be made for the installation of bulky supports outside the limits of the finished section.

With the demand for roof bolting materials literally skyrocketing, a large number of mine suppliers turned to manufacturing bolts and anchoring devices. In too many instances little consideration was given to bolt materials, bolt sizes, or interchangeability of parts made by different manufacturers.

Hastened by a rash of roof fall accidents in which the strength of the bolts was suspect, the need for standards in roof bolting materials soon became apparent, and in 1950 the Roof Action Committee of the American Mining Congress Coal Division set up a subcommittee to begin work toward this end. The result was a set of recommendations with the following purposes:

"(1) *Safety*: To protect the consumer by assuring that roof bolting materials shall be made in accordance with certain specifications pertaining to quality and minimum dimensions. It must be remembered that the lives of mine workers are dependent upon an effective roof structure provided by roof bolting. In all safe structural designs it is common practice to avoid loading materials beyond their elastic limits. This should be considered an inherent practice in roof bolting. Overloading during installation should not be allowed. Therefore, these specifications, which require minimum tensile properties for the bars from which roof bolts are made, are very necessary. The minimum yield loads shown on the accompanying drawings for each bolt are particularly significant as far as practical applications are concerned.

"(2) *Interchangeability:* To establish certain manufacturing practices to provide a uniformity of product without suppressing improvements in design and advancements in engineering."

To meet these purposes, steel specifications and basic dimensions were established for bolts, anchoring devices, and auxiliary material such as roof plates, angle washers, ties, and channels. Briefly, these are as follows:

(a) Steel specifications for bolts call for open-hearth or electric furnace steels that meet the Tentative Specifications for Carbon Steel Bars subject to Mechanical Property Requirements, ASTM Designation A-306, latest issue. Bars from which roof bolts are made need to have as a minimum the tensile properties listed in Table I.

(b) Essential, basic, and minimum dimensions of 5/8-inch and 3/4-inch squarehead roof bolts and 1-inch slotted roof bolts are shown in Figure 1.

(c) Material for expansion shells and plugs, the most common type of anchoring device, must conform to the ASTM Specifications for Malleable Iron Castings, A-47, latest issue, Grade 32510, or be forged steel with a maximum sulphur content of 0.23 percent.

The specifications for Roof Bolting Materials in Coal Mines were approved by the American Mining Congress Committee on Roof Action and published as an industry standard. The proof of any standard, of course, is in its acceptance by those concerned. The American Mining Congress is proud of the way in which its recommendations on roof bolting materials have been received. Because of widespread endorsement, the recommendations were submitted to the American Standards Association and have been accepted as American Standard.

ENGINEERING DRAWING AT THE CROSSROADS

Unification versus uncontrolled simplification

by **George Noble**

MR NOBLE is in charge of the standards department of the Dominion Engineering Works, Limited, Montreal, Canada. He is vice-chairman of the Canadian Standards Association's Committee on Engineering Drawings, Mechanical Section, which prepared Canadian Standard B78.1-1954, and is responsible for work on a second edition of this standard. He is also a member of the CSA Committee on Screw Products. Mr Noble has been active in work on ABC Unified Drafting Practices and was one of the Canadian representatives at the ABC meeting on drawings at Toronto in 1957. He is a Fellow of the Standards Engineers Society.

CLEARLY the time has come for careful re-appraisal of the present status of Engineering Drawing Standards. Unfortunately, all too few people, even those employed in the engineering industry, are aware of the tremendous amount of time and money which has been expended by groups in the ABC (America, Britain, Canada) countries to unify the drawing practices of the inch-using and English-speaking world. This project, now so near completion, is the result of some six major conferences and nearly 14 years of devoted effort by these groups.

As we are now very close to the attainment of a unified document for all inch-using countries, it is somewhat alarming to realize the intense publicity and propaganda for so-called functional and simplified drafting practices which, if uncontrolled, may tend to defeat the whole purpose of unification. Simplified drafting, which has received a tremendous amount of publicity during the past four or five years, is by no means a new concept. A careful perusal of previously published national drawing standards, as for example, American Standard Y14.1-1957, and British Standard 308, as well as several other industry-wide standards, shows that these have for years included well-known and established conventions with the purpose of saving time in the drawing office.

Such conventions as the symbols for screw threads, half views of symmetrical objects, around-the-center line, and many others are listed in the older editions of these standards. These conventions are simplified practices that are constantly under review. New developments are evaluated by drawing standards committees in all three countries with a view to eventual incorporation of those which receive wider acceptance and approval by industry. Acceptance as a Unified practice, however, is contingent upon a general consensus of all concerned. In some cases, agreement on standards has preceded acceptance by several years. For example, in the case of the introduction of symbols for the tolerancing of form and position on drawings, simple ideographic symbols were proposed for use as far back as 1950. They were included on an optional basis in the revised MIL-STD

8A-1953 and their use has been favorably reported on by the MIL-STD committees.

At the ABC Toronto meeting, October 1957, agreement was reached on the form these symbols would take, if and when they were adopted in the national standards of the three countries. Canada agreed to adopt these symbols into the body of the second edition of the Canadian Standard B78.1 and the other two countries agreed to publish the symbols and interpretation either in an Appendix or as otherwise determined, pending eventual adoption by all three. This procedure appears to be the correct and sensible method of introducing new ideas into the drawing practices which will not conflict with the ideal of Unification. Sufficient time elapses for these to be proved and for all concerned to become familiar with what is being attempted before the national standards are revised to set their seal of approval on new practices.

This is the procedure which should be followed with all proposed simplified practice. Otherwise, we are faced with completely uncontrolled simplification, which is likely to run to extremes. Some people seem inclined to go completely overboard on the idea of reducing drawing office costs even to the detriment of clarity and elimination of essential information which may eventually reflect in added costs elsewhere. The writer was recently greatly concerned to discover a pamphlet published by the U. S. Government and bearing the approval of the U. S. Navy Department Bureau of ships[1] which includes some simplified practices by no means universally used and definitely opposed by a large section of expert opinion in all three ABC countries. This is the more remarkable as the staunchest proponents of ABC Unification from the very beginning of this international effort, have been the United States Armed Forces, which have contributed a tremendous amount of time, effort, and money to the cause of Unification. With a great deal of success attending these efforts, it is somewhat of a paradox to find this support for a project which, unless strictly controlled, as above suggested, may tend to defeat the whole objective of ABC Unification.

Is it too much to expect that our enthusiastic proponents of simplified drawing should direct their undoubted persuasive talents to the following program?

(*a*) To encourage by every means in their power, the use of their own national standards and to discourage the use in local company standards of all practices not in strict conformity thereto.

(*b*) To encourage and propagate the ABC Unification concept and to spread the gospel of Unification, since far too few people are aware of the urgency of this. If any doubt exists as to the vital need for unified drawing standards, a comparison of the 226 hours in the Russian Engineer's Curriculum, with the meager and ever dwindling periods allotted to descriptive geometry and drawing in the universities of the Free Western World is sufficient answer.[2]

(*c*) To discourage the commercial exploitation of the interest which has been shown in simplified drawing and to divert most of their energies to the problem of developing and encouraging the use of simpler and more efficient drafting, equipment, methods and materials, a field which requires more attention and promises greater savings, than experimenting with shorthand methods, which, if uncontrolled, will only confuse and delay true standardization and unification.

It must be realized that the members of national drawing standards committees, such as ASA Y14, BSI 308, and CSA B78.1 are by no means indifferent to simplified drawing. On the contrary, they have already incorporated many practices in existing standards and are alert to all new developments which, when proven and approved by a consensus of all three national committees will be integrated and become unified practice.

[1] EDITOR'S NOTE: The document referred to by the author (NAVSHIPS 250-520-6, Functional Drafting, Revised November 1957) does not have the approval of the Department of Defense Standard Drawing Practice Committee which has the responsibility for developing MIL-STDS applicable to all services. Thus criticism, if warranted, can rightly be directed only at BuShips rather than at the U. S. Armed Forces.

[2] See Part 1 of article by Abetti & Lincks in, "Electrical engineering education and research in the USSR." *Electrical Engineering*, May, 1958, page 388.

ISO SCHEDULES FIRST MEETING ON CORK

● The first committee meeting to consider the development of international standards for cork will be held in Lisbon, Portugal, from October 29 to 31, 1958, it was announced by the American Standards Association.

The United States will not participate in this project, according to a decision recently taken by represenatives of the U.S. cork industry.

However, under the rules of the International Organization for Standardization (ISO), the United States retains observer status, and any observer delegate who is interested to attend will be entitled to do so after having been accredited by the American Standards Association not later than September 25, 1958.

The request for an international standards project on cork was submitted last year by Portugal, and a Technical Committee 87 was formed after a sufficient number of countries expressed their willingness to participate.

In addition to Portugal, which is the secretariat country of the project, the following countries are participating members of ISO Technical Committee 87: France, Mexico, Spain, Sweden, and the United Kingdom.

The International Organization for Standardization provides organizational facilities for the development of international engineering, industrial, and commercial standards. American interests in international standards work are represented through the American Standards Association, U.S. member of ISO and the clearinghouse for national standards in the United States.

news briefs . . . . .

Standards Engineers Society Plans Annual Meeting September 22-24

Final plans are being completed for the Standards Engineers Society's Seventh Annual Meeting at the Benjamin Franklin Hotel, Philadelphia, Pa., September 22-24.

Sessions will feature the effective utilization of manpower through standardization, the impact on standardization of electronic data processing, standards engineering problems of tomorrow, drafting practices, education for standards engineering, materials for the space age, and Canadian standardization techniques.

Tuesday afternoon, September 23, will be devoted to three concurrent workshop sessions.

Awards will be presented at a luncheon Wednesday, September 24, with Roger E. Gay as speaker.

Norman L. Mochel, manager, Metallurgical Engineering, Westinghouse Electric Corporation, Philadelphia, and past president of the American Society for Testing Materials, will be speaker at the annual banquet, Tuesday evening.

H. G. Arlt, Bell Telephone Laboratories, Murray Hill, N. J., president of the Standards Engineers Society, will open the meeting.

L. G. Harrison, standards supervisor, Link Aviation, Inc, will be moderator of the session on effective utilization of manpower, Monday morning, September 22. Speakers will be A. F. Gagne, Jr, consulting engineer, and publisher of the Society's magazine, *Standards Engineering*, and D. H. Colburn, Manufacturing Standards Division, IBM Corporation. Mr Gagne will stress engineering manpower and Mr Colburn will take up manufacturing manpower.

One of the Monday afternoon sessions will be a symposium describing the problems in standardization created by the expansion of man's activity in space. Speakers will be R. M. White, Office of the Chief of Ordnance, Department of the Army, and staff members from the Air Force and from the American Machine and Foundry Company.

At the other, S. H. Watson, manager, Standardizing Division, Radio Corporation of America, will speak on the impact of electronic data processing on standardization.

H. D. Keil, Canadian Industries, Ltd, will be moderator of the Tuesday morning session on drafting practices. Speakers will be R. F. Francoise, Engineering Administrative Consulting Services, General Electric Company, on drafting in the aircraft industry; R. Hill, Northern Electric Company, on a challenge for drafting standardization; and G. M. Noble, Dominion Engineering Works, Ltd., on national and international drafting standardization.

A concurrent session on education for standards engineering will be moderated by A. M. Rosenwald, Tracerlab, Inc. Speakers will be L. B. Moore, associate professor in industrial management, Massachusetts Institute of Technology, on engineering at the college level; M. S. Gokhale, drafting coordinator, Defense Electronics Products, Radio Corporation of America, on the Society's research and education program; and Dr John Gaillard, management counsel, on training in industry for standards engineering.

At the Wednesday morning session on materials for the space age, C. W. Straitor, Jr, Detroit Edison Company, will be moderator.

R. L. Sproat, chief metallurgist, Standard Pressed Steel Company, and J. L. Woodward, Materials Laboratories Section, Chrysler Corporation, Missile Division, will speak on standardization of nonmetallics in missile usage.

The concurrent session on Canadian standardization techniques, will have G. Wells, Canadian General Electric Company, Ltd, as moderator. The three speakers will be M. A. Phipps, chief of design services engineering, Orenda Engines, Ltd, on the Canadian aircraft industry; S. H. Chandler, executive assistant general manager, Ontario Hydro-Electric Commission, on standardization work of the Commission; and R. M. Gooderham, director of the Canadian Welding Bureau, on Canadian welding codes.

For further information about the meeting, write Miss M. M. Hoagland, Leeds & Northrup Co, 4901 Stenton Avenue, Philadelphia 44, Pa.

● Two awards have been presented this year by the Standards Engineers Society and the American Society for Testing Materials, jointly, for outstanding contributions to standards. One was presented to Leo B. Moore, associate professor of industrial management, Massachusetts Institute of Technology, for outstanding contributions to the literature of standards. The other was presented to Roger E. Gay, industrial executive, for outstanding service in the interest of standardization.

Mr Moore, teacher, philosopher, and author, has conducted the column "Standards Outlook" in THE MAGAZINE OF STANDARDS for the past five years. He wrote the section on industrial standardization in the *Handbook of Industrial Management and Engineering*, and has written many articles on all phases of standardization. He has pioneered in teaching the only full-term college course in standardization, acts as a standards consultant, and has participated in many Work Simplification Conferences. The award was presented, according to the citation, "for his pioneering writing and expression of philosophy applied to the practical everyday techniques of standardization."

Mr Gay has worked for standardization both in industry and in the Government. Before his service with the Department of Defense as director of Cataloging, Standardization, and Inspection, he was president of the Bristol Brass Corporation, Bristol, Conn. He has held directorships in the National Association of Manufacturers and many other organizations. He was president of the American Standards Association from 1952-1954, and received the Howard Coonley Medal from ASA in 1957. In his work as the Defense Department's director of Catalog-

ing, Standardization, and Inspection, Mr Gay led the way toward development of more effective standardization within the Government and coordination of Government standards with industry. For his "effective leadership in standardization in both industry and Government," the SES-ASTM has presented its 1957 "outstanding service" award.

● R. H. Arndt, vice-president of the Baltimore Gas and Electric Company, has been named as the American Gas Association's representative

R. H. Arndt

on the Standards Council. Mr Arndt has had experience in ASA work as the AGA representative on the Miscellaneous Standards Board, and as a member of Sectional Committee Z21, Approval Requirements for Gas-Burning Appliances, AGA Approval Requirements Committee.

Graduated from the University of Illinois with a B.S. in Mechanical Engineering, Mr Arndt studied gas engineering at Columbia University and Business Management at Johns Hopkins University.

He entered the gas utility business in Rockford, Illinois, his home town, as an employee of the American Gas Company. Later he transferred to Baltimore, Maryland, to work for the Baltimore Gas and Electric Company, first as superintendent, then general superintendent, and now as vice-president of gas operations. He is a member of a number of national engineering societies, and is a registered professional engineer in Maryland.

● The Atomic Energy Commission recently announced development of a fluorescent paint to mark all radioactive materials and equipment and all areas where the danger of radiation exists. The color of the paint meets the requirements of the American Standard Safety Color Code for Marking Physical Hazards and the Identification of Certain Equipment, Z53.1-1953. The American Standard calls for a "vivid reddish purple" to mark radiation hazards. The fluorescent purple is "startlingly brighter" in daylight than the nonfluorescent purple, the announcement indicates, and can be easily distinguished as Radiation Purple when viewed at a distance.

● The American Standards Association is calling a general conference for September 9, 1958 of all national groups that would be substantially concerned with the scope and provisions of residential building code requirements. The purpose of the conference will be to determine whether a consensus can be reached on the initiation of a project for the development of American Standard building code requirements for one- and two-family houses.

The general conference is the direct result of a request which the American Standards Association received from publisher Henry R. Luce on behalf of 14 national organizations concerned with home building.

"Conflicting and often archaic codes are adding at least $1,000 to the cost of the average new house built this year," Mr Luce said. "This is a figure too dramatic and urgent to be ignored. On one million new homes, this multiplies out to over $1 billion a year of waste caused through building codes."

"Specific wastes are small compared to what could be saved if conflicting local codes were not blocking economies of nation-wide standardization and discouraging the efforts of architects and builders to develop new ways to build better for less," he added.

Mr Luce based his statement on the findings of an industry roundtable conference on home building codes held last May. According to the experts present at this conference, ten common wastes enforced by many local codes alone add more than $1,000 to the price of a house. These wastes include wiring installations more costly than necessary; over-engineered framing lumber sizes; a ban on trusses; trusses and studs spaced more closely than necessary; needlessly heavy sheathing; needlessly heavy sub-flooring; vents spaced more closely than necessary; oversized or overweight pipes; and useless housetraps on waste lines.

Building code requirements are a prerogative of every local community. Thousands of different codes exist throughout the country. Many codes are based on building methods that are 20 to 50 years old.

Because of such code inadequacies, it costs, according to builders, nearly $2,000 more to build a small house in Staten Island, N.Y., than to build the same house five miles away in Middletown, N.J.

The most practical means of obtaining unified building codes throughout the country is, according to the building experts at the roundtable conference, to develop nationally recognized code requirements which individual communities or state governments can adopt.

Such nationally recognized codes exist already for plumbing and electrical installations in the form of two American Standards – the National Plumbing Code and the National Electrical Code—which have been adopted by a majority of local building authorities.

The 14 national groups on whose behalf Mr Luce submitted the request for American Standard building code requirements are:

American Council to Improve Our Neighborhoods (ACTION), the American Institute of Architects, Building Research Advisory Board, Building Research Institute, Construction and Civic Development Department of the U.S. Chamber of Commerce, the Home Manufacturers Association, the Lumber Dealers Research Council, the Mortgage Bankers Association of America, the National Association of Home Builders, the National Association of Mutual Savings Banks, the National Association of Real Estate Boards, the National Retail Lumber Dealers Association, the Mortgage Lending Policy Committee of the Life Insurance Association, and the United States Savings and Loan League.

The proposal submitted to the American Standards Association included the following requests:

1. That the American Standards Association institute the necessary procedures to develop and approve American Standard code require-

(*Continued on page* 246, *col* 3)

Standards Outlook

by LEO B. MOORE

Mr Moore is Associate Professor of Industrial Management, Massachusetts Institute of Technology, where he teaches a full-term course in industrial standardization.

CONCLUSION

Five years ago the idea was conceived of having this column in THE MAGAZINE OF STANDARDS to provide an opportunity for expressing some ideas about standardization and standards programs. The central theme has been the company and its standards work, with some forward thinking and perspective introduced under the hopeful title of "Standards Outlook." However, the end is here.

I would like to express my thanks to the folks at ASA who not only approved of this idea, but were most cooperative in my labored efforts to clarify and introduce some standards ideas through these columns. Naturally, I was always pleased when some kindly soul exercised the urge to say or write a thoughtful word and thereby provided encouragement and assurance. I like to feel that "Standards Outlook" gave others the courage to try their hand and in that way, as the first in its field, became the sire of similar efforts.

Having at one time established and administered a company standards program and later having volunteered to teach standardization to young engineers, I found, as most teachers do, that the problem of doing an effective teaching job was considerably different from that of running a program. The teaching ideas generally became the source of the columnideas. The attempts to answer the prodding questions of the diligent student furnished the foundation for whatever new notions were included in these short writings.

We have tried to explore, for example, the whole area of the relationship of the standards program to the management picture. This, of necessity, includes some ideas about management support, evaluation of program efforts, organization arrangement, and the fundamental purposes of standardization. Closely related to this area are the human relations problems that have an intimate impact upon the effectiveness of a standards program. These considerations include the qualities of a standards engineer, the method of operation of a standards department, its relations with other sections of the company, and the personal, human contact that greatly influences these matters. The larger viewpoint for the standards program also received some consideration in the form of suggested activities, for example, in paperwork, training in the company, extra-company endeavors, and consumer concern. Out of the teaching efforts have come some ideas about basic principles and techniques in the field, such as the standards guide and the standards pattern. All of the columns were presented in the sincere hope that they might in some small way make a contribution to standardization.

No one knows better than I do that much remains to be done in the field. As standards engineers strive to attain professional status, nothing will sustain them more than a foundation of teaching and research. A profession is supported by its research endeavors, which are fostered and nourished by its educational accomplishment. Those who believe in standardization must soon come to realize the dire need of providing realistic support for these continued efforts in order that the field may come to full bloom and bear vigorous fruit.

News Briefs—(cont'd)

ments for the construction of one- and two-family residences.

2. That, in order to speed development and approval of these American Standard code requirements, the first stage of this procedure be limited to consolidating in a single American Standard the already almost identical one- and two-family house construction requirements of the Building Officials Conference of America, Southern, International, and New York State codes. "The one exception we ask is that from the beginning the new code should permit the framing lumber sizes approved by the most up-to-date stress tables of the National Lumber Manufacturers Association," they said.

3. That the American Standards Association make these requirements applicable to three- and four-family residences as well, if that extension proves practicable.

4. That the American Standards Association set up the machinery for an annual revision of the proposed code for one- and two-family houses. The whole process of home building is now undergoing revolutionary changes; those changes are coming so fast that without a yearly revision even the best code would soon be obsolete. It is important that the American Standard keep ahead of the industry's progress and authorize the use of better methods and materials even before most architects and builders are ready to use them. In short, it is imperative that the American Standard code stimulate and encourage progress instead of retarding it.

WALTER C. WAGNER

It is with sincere regret that the American Standards Association has learned of the death of Walter C. Wagner, pioneer in the work of ASA's Standards Council. Mr Wagner became a member of the Council when it was first organized in 1929 after reorganization of the American Engineering Standards Committee to form the American Standards Association. As a representative of the Electric Light and Power Group he served on the Council until December 1955. He was vice-chairman in 1948 when L. F. Adams, then chairman of the Council, died suddenly. Mr Wagner suc-

ceeded Mr Adams as acting chairman, and was elected the following year to serve as chairman in his own right. He was re-elected in 1949, and again in 1950. As chairman of the Council he was ex officio a member of the Board of Directors, and continued to serve as a member until 1954.

Mr Wagner was an active member of the United States National Committee of the International Electrotechnical Commission up to the time of his death. He considered his work on IEC as one of his most important achievements. As a member of the USNC, he took an active part in arrangements for the Fiftieth Anniversary Celebration of the IEC that was held in Philadelphia in 1954.

Mr Wagner also was proud of the work accomplished on development of the National Electrical Safety Code. He was a member of Sectional Committee C2 on the Code from 1937 until the time of his death, and had served as chairman since 1953.

Mr Wagner was graduated from the University of Washington with a B.S. in Electrical Engineering, and from Cornell University with an M.M.E. He worked from 1913-1918 at the National Bureau of Standards as a physicist. In 1918 he joined the staff of the Philadelphia Electric Company, where he continued until his retirement several years ago. During World War II, he was on leave of absence with the U.S. Navy, where he worked on electrical research and standards, with the rank of Captain, USNR.

He had taken part in advances in electrical service metering, and was joint author of technical bulletins and of numerous papers for technical journals. He had served as a Board member of the National Fire Protection Association and the Franklin Institute, and was a Fellow of the American Institute of Electrical Engineers and of the Illuminating Engineering Society. He was also a member of the Air Pollution Control Association, and of the United States National Committee of the International Commission on Illumination.

PUBLISHED AMERICAN STANDARDS

If your company is a member of the American Standards Association, you are entitled to receive membership service copies of these newly published American Standards. Find out who your ASA contact is in your company. Order your American Standards through him. He will make sure your company receives the membership service to which it is entitled.

ACOUSTICS, VIBRATION, AND MECHANICAL SHOCK

Calibration of Electroacoustic Transducers, Particularly Those for Use in Water, Procedures for, Z24.24-1957 $2.00
Sponsor: Acoustical Society of America

BUILDING AND CONSTRUCTION

Billet-Steel Bars for Concrete Reinforcement, Specifications for, ASTM A 15-57T; ASA A50.1-1958 (Revision of ASTM A 15-54T; ASA A50.1-1956)

Rail-Steel Bars for Concrete Reinforcement, Specifications for, ASTM A 16-57T; ASA A50.2-1958 (Revision of ASTM A 16-54T; ASA A50.2-1956)

Axle-Steel Bars for Concrete Reinforcement, Specifications for, ASTM A 160-57T; ASA G43.1-1958 (Revision of ASTM A 160-54T; ASA G43.1-1956)
(Bound together) $0.75
Sponsor: American Society for Testing Materials

Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units, Tentative Specifications for, ASTM C 126-57T; ASA A101.1-1958 (Revision of ASTM C 126-55T; ASA A101.1-1956) $0.30
Sponsor: American Society for Testing Materials

DRAWINGS, SYMBOLS, AND ABBREVIATIONS

Letter Symbols for Hydraulics, Y10.2-1958 (Revision of Z10.2-1942) $1.00
Sponsor: American Society of Mechanical Engineers

American Drafting Standards Manual, Section 11, Plastics, Y14.11-1958 (Partial revision of Z14.1-1946) $1.50
Sponsors: American Society of Mechanical Engineers; American Society for Engineering Education

MATERIALS AND TESTING

ASTM Thermometers, Specifications for, ASTM E 1-57; ASA Z71.1-1958 (Revision of ASTM E 1-56; ASA Z71.1-1956 $0.75
Sponsor: American Society for Testing Materials

PAINTS AND VARNISHES

Dry Mercuric Oxide Pigment, Chemical Analysis of, ASTM D 284-57T; ASA K59.1-1958 (Revision of ASTM D 284-33; ASA K59-1941) $0.30
Sponsor: American Society for Testing Materials

PHOTOGRAPHY

Focal Lengths and Markings of 35mm Motion-Picture Projection Lenses, PH22.28-1958 (Revision of Z22.28-1946) $0.25

Dimensions for 35mm Motion-Picture Film, Perforated 32mm, 2R-2994, PH22.73-1958 (Revision of PH22.73-1951) $0.25

Four Magnetic Sound Records on 35mm Film, PH22.108-1958 $0.25

Picture and Sound Apertures for Continuous Contact Printers for 35mm Release Prints with Photographic Sound, PH22.111-1958 $0.25

100-Mil Magnetic Coating on 16mm Film, Perforated One Edge, PH22.87-1958 (Revision of PH22.87-1953) $0.25

Scene-Change Cueing for Printing 16mm Motion-Picture Film, PH22.89-1958 $0.25

Picture-Sound Separation in 16mm Magnetic Sound Projectors, PH22.112-1958 $0.25
Sponsor: Society of Motion Picture and Television Engineers

PIPE AND FITTINGS

Standard Strength Perforated Clay Pipe, Specifications for, ASTM C 211-57T; ASA A106.1-1958 (Revision of ASTM C 211-50; ASA A106.1-1954) $0.30

Standard Strength Clay Sewer Pipe, Specifications for, ASTM C 13-57T; ASA A106.3-1958 (Revision of ASTM C 13-54; ASA A106.3-1955) $0.30

Standard Strength Ceramic Glazed Clay Sewer Pipe, Specifications for, ASTM C 261-57T; ASA A106.4-1958 (Revision of ASTM C 261-54; ASA A106.4-1955) $0.30
Sponsor: American Society for Testing Materials

AMERICAN STANDARDS UNDERWAY . . .

Status as of July 18, 1958

BUILDING AND CONSTRUCTION

In Board of Review

Areas in School Buildings, Method of Determining, Z65.2-

Areas in Public Buildings, Method of Determining, Z65.3-
Sponsors: National Association of Building Owners and Managers; Office of Education, Department of Health, Education and Welfare

CHEMICAL INDUSTRY

In Board of Review

Common Name for the Pest Control Chemical *O*-2-chloro-4-nitrophenyl *O,O*-dimethyl phosphorothioate (dicapthon), K62.14-

Common Name for the Pest Control Chemical 2-chloro-2-diethylcarbamoyl-1-methylvinyl dimethyl phosphate (phosphamidon), K62.15-

Common Name for the Pest Control Chemical *O,O*-dimethyl *S*-(*N*-methylcarbamoylmethyl) phosphorodithioate (dimethoate), K62.16-
Sponsor: U. S. Department of Agriculture

In Standards Board

Addenda (K62.1a-) to American Standard Procedure for the Acceptance of an American Standard Common Name for a Pest Control Chemical, K62.1-1956
Sponsor: U. S. Department of Agriculture

DRAWINGS, SYMBOLS, AND ABBREVIATIONS

In Board of Review

Graphical Symbols for Fluid Power Diagrams, Y32.10-
Sponsors: American Society of Mechanical Engineers; American Institute of Electrical Engineers

ELECTRIC AND ELECTRONIC

American Standards Approved

Single and Heavy Nylon-Coated Round Copper Magnet Wire, NEMA MW 6-1957; ASA C9.8-1958

Single-Paper-Covered Round Copper Magnet Wire, NEMA MW 31-1956; ASA C9.9-1958

Paper-Covered Rectangular and Square Copper Magnet Wire (One Paper ¾ Lap or Four Intercalated Papers), NEMA MW 33-1957; ASA C9.10-1958

Glass-Fiber-Covered Rectangular and Square Copper Magnet Wire, NEMA MW 42-1957; ASA C9.11-1958
Sponsor: National Electrical Manufacturers Association

Fittings for Rigid Steel Conduit and Electrical Metallic Tubing, Specification for, C80.4-1958
Sponsors: American Iron and Steel Institute; National Electrical Manufacturers Association

Residential Wiring Handbook, C91.1-1958
Sponsor: Industry Committee on Interior Wiring Design

In Board of Review

Schedules of Preferred Ratings for Alternating- and Direct-Current Low Voltage Air Circuit Breakers, C37.16- (Revision of C37.16-1956)
Sponsor: Electrical Standards Board

Ceramic Dielectric Capacitors, Classes 1 and 2, Recommendations for, C83.4- (Revision of EIA REC-107-A; ASA C83.4-1955)

Electrolytic Capacitors (For Use Primarily in Transmitters and Electronic Instruments), Requirements for, C83.15- (Revision of EIA TR-140; ASA C83.15-1956)

Circular Waveguides, Requirements for, EIA RS-200; ASA C83.19-
Sponsor: Electronic Industries Association

In Standards Board

Definitions of Electrical Terms (Partial revision of C42-1941)
Group 15, Transformers, Regulators, Reactors, and Rectifiers, C42.15-
Group 50, Electric Welding and Cutting, C42.50- (Revision of C42.50-1956)
Sponsor: American Institute of Electrical Engineers

Vibrators for Auto Radios, Requirements for, EIA RS-187; ASA C83.20- (Revision of EIA REC-113; ASA C16.16-1949)
Sponsor: Electronic Industries Association

GAS-BURNING APPLIANCES

In Board of Review

Addenda (Z21.1.1b) to American Standard Approval Requirements for Domestic Gas Ranges, Volume I, Free Standing Units, Z21.1.1-1956

Addenda (Z21.1.2b) to American Standard Approval Requirements for Domestic Gas Ranges, Volume II, Built-In Domestic Cooking Units, Z21.1.2-1956

Addenda (Z21.5b) to American Standard Approval Requirements for Domestic Gas Clothes Dryers, Z21.5-1956

Addenda (Z21.6a) to American Standard Approval Requirements for Domestic Gas-Fired Incinerators, Z21.6-1957

Installation of Domestic Gas Conversion Burners, Requirements for, Z21.8- (Revision of Z21.8-1948)

Addenda (Z21.10.1b) to American Standard Approval Requirements for Gas Water Heaters, Volume I, Z21.10.1-1956

Addenda (Z21.10.2b) to American Standard Approval Requirements for Gas Water Heaters, Volume II, Side-Arm Type Water Heaters, Z21.10.2-1956

Addenda (Z21.11b) to American Standard Approval Requirements for Gas-Fired Room Heaters, Z21.11-1956

Central Heating Gas Appliances, Approval Requirements for, Volume I, Steam and Hot Water Boilers, Z21.13.1- (Revision of Z21.13.1-1956)

Central Heating Gas Appliances, Approval Requirements for, Volume II, Gravity and Forced Air Central Furnaces, Z21.13.2- (Revision of Z21.13.2-1956)

Addenda (Z21.13.3b) to American Standard Approval Requirements for Central Heating Gas Appliances, Volume III, Gravity and Fan Type Floor Furnaces, Z21.13.3-1956

Central Heating Gas Appliances, Approval Requirements for, Volume IV, Gravity and Fan Type Vented Recessed Heaters, Z21.13.4- (Revision of Z21.13.4-1955)

Gas Valves, Listing Requirements for Z21.15- (Revision of Z21.15-1954)

Addenda (Z21.16a) to American Standard Approval Requirements for Gas Unit Heaters, Z21.16-1957

Domestic Gas Conversion Burners, Listing Requirements for, Z21.17- (Revision of Z21.17-1958)

Relief and Automatic Gas Shut-Off Valve for Use on Water Heating Systems, Listing Requirements for, Z21.22- (Revision of Z21.22-1935)

Gas-Fired Duct Furnaces, Approval Requirements for, Z21.34- (Revision of Z21.34-1955)
Sponsor: American Gas Association

Reaffirmation Approved

Draft Hoods, Listing Requirements for, Z21.12-1937 (R1958)

Refrigerators Using Gas Fuel, Approval Requirements for, Z21.19-1941 (R1958)

Furnace Temperature Limit Controls and Fan Controls, Listing Requirements for Z21.29-1941 (R1958)

Gum Protective Devices, Listing Requirements for, Z21.35-1945 (R1958)
Sponsor: American Gas Association

MECHANICAL

In Standards Board

National Miniature Screw Threads, B1.10-
Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

Knurling, B5.30- (Revision of B5.30-1953)
Sponsors: American Society of Tool Engineers; Metal Cutting Tool Institute; National Machine Tool Builders' Association; American Society of Mechanical Engineers; Society of Automotive Engineers

Slotted and Recessed Head Wood Screws, B18.6.1- (Revision of B18.6.1-1956)
Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

Plain Washers, B27.2- (Revision of B27.2-1953)
Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

Double-Pitch Conveyor Chains, Attachments and Sprockets, B29.4a- (Supplement to B29.4-1954)

Small Pitch Silent Chains and Sprocket Tooth Form (Less than ⅜ inch Pitch), B29.9-
Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

Diamond Dressing Tools, B67.1-
Sponsors: Industrial Diamond Association of America; American Society of Tool Engineers

MINING

American Standard Withdrawn

Use of Explosives in Bituminous Coal Mines, Recommended Practice for, M14-1930
Sponsor: Mine Inspectors Institute of America

MISCELLANEOUS

In Standards Board

Preferred Numbers, Z17.1- [Revision of Z17.1-1936 (R1951)]
Endorsing Sponsor: American Institute of Electrical Engineers

PHOTOGRAPHY

American Standards Approved

Curl of Photographic Film, Methods for Determining the, PH1.29-1958

Film in Rolls for Recording Instruments, Graphic Arts, Photo Typesetting, Portrait, X-ray and Related Use, Dimensions for, PH1.30-1958
Sponsor: Photographic Standards Board

Sensitometric Exposure of Daylight-Type Color Films, PH2.11-1958
Sponsor: Photographic Standards Board

Sulfuric Acid, Specifications for Photographic Grade, PH4.101-1958 (Revision of Z38.8.101-1949)

Citric Acid, Monohydrate, Specifications for Photographic Grade, PH4.102-1958 (Revision of Z38.8.102-1949)

Boric Acid, Crystalline, Specifications for Photographic Grade, PH4.103-1958 (Revision of Z38.8.103-1949)

Hydrochloric Acid, Specifications for Photographic Grade, PH4.104-1958 (Revision of Z38.8.104-1949)
Catechol, Specifications for Photographic Grade, PH4.131-1958 (Revision of Z38.8.131-1948)
Formaldehyde, Specifications for Photographic Grade, 37-Percent Solution, PH4.152-1958 (Revision of Z38.8.152-1949)
Sodium Sulfate Anhydrous, Specifications for Photographic Grade, PH4.175-1958 (Revision of Z38.8.175-1949)
Sodium Bisulfite, Anhydrous, Specifications for Photographic Grade, PH4.276-1958 (Revision of Z38.8.276-1949)
Sponsor: Photographic Standards Board
8mm Motion-Picture Projection Reels, PH22.23-1958 (Revision of Z22.23-1941)
16mm Motion-Picture Film, 1R 2994, Dimensions for, PH22.109-1958
16mm Motion-Picture Film, 2R-2944, Dimensions for, PH22.110-1958
Sponsor: Society of Motion Picture and Television Engineers

In Board of Review

Photographic Roll Paper, Dimensions for, PH1.11- (Revision of PH1.11-1953)
Brittleness of Photographic Film, Method for Determining the, PH1.31-
Sponsor: Photographic Standards Board

PIPE AND FITTINGS

In Board of Review

Butt-Welding Ends, B16.25- (Revision of B16.25-1955)
Sponsors: Mechanical Contractors Association of America; Manufacturers Standardization Society of the Valve and Fittings Industry; American Society of Mechanical Engineers

SAFETY

Withdrawal Being Considered

Leather Aprons, L18.1-1944
Leather Cape Sleeves and Bibs, L18.2-1944
Leather Leggings (Knee Length), L18.3-1944
Leather Coats, L18.4-1944
Leather Overalls, L18.5-1944
Leather Sleeves, L18.6-1944
Welders Leather Gauntlet Gloves, L18.7-1944
Protective Leather Gloves, Steel Stapled, L18.8-1944
Asbestos Gloves, L18.9-1944
Asbestos Gloves, Leather Reinforced, L18.10-1944
Asbestos Mittens, L18.11-1944
Asbestos Mittens, Leather Reinforced, L18.12-1944
Asbestos Aprons (Bib Type), L18.14-1944
Asbestos Cape Sleeves and Bibs, L18.15-1944
Asbestos Leggings (Knee and Hip Length), L18.16-1944
Asbestos Coats, L18.17-1944
Leather One-Finger Mittens, L18.18-1945
Leather Mittens, L18.19-1945
Asbestos One-Finger Mittens, L18.20-1945
Flame-Resistant Fabric Aprons (Bib Type), L18.21-1945
Flame-Resistant Fabric Leggings (Knee and Hip Length), L18.22-1945
Flame-Resistant Fabric Coats, L18.23-1945
Flame-Resistant Fabric Pants, L18.24-1945
Flame-Resistant Fabric Coveralls (Jumper Suits), L18.25-1945
Flame-Resistant Fabric Spats, L18.26-1945
Leather Spats, L18.27-1945
Asbestos Spats, L18.28-1945
Chemical-Resistant Gloves, L18.29-1945
Sponsor: Industrial Safety Equipment Association

WHAT'S NEW ON AMERICAN STANDARDS PROJECTS

Number Designation of Refrigerants, B79—

Sponsor: American Society of Refrigerating Engineers

A new standard that provides a number for each and every refrigerant has been submitted to the American Standards Association by the ASRE under the Existing Standards Method. The standard makes it possible to refer to such chemicals as "dichlorodifluoromethane" as "CC-L_2F_2" for example, or "Freon 12" as "Refrigerant 12." This standard will affect every other American Standard that refers to specific refrigerants, as it is expected that the number designation will be used for reference purposes.

Code for Pressure Piping, B31—

Sponsor: American Society of Mechanical Engineers

Interpretation submitted by the sponsor.

From time to time actions taken by Sectional Committee B31 are published for the information of all who are interested in use of the American Standard Code for Pressure Piping, B31.1-1955. While these actions do not constitute formal revision of the Code, they may be utilized in specifications, or otherwise, as representing the considered opinion of the committee.

Case No. 29 has just been released and is published below as interim action of Sectional Committee B31 on the Code for Pressure Piping, but will not constitute a part of the Code until formal action has been taken by the American Society of Mechanical Engineers as sponsor and by the American Standards Association on approval of a revised edition.

Cases No. 30, 31, and 32 were released previously and have been published in the April, February, and May issues of THE MAGAZINE OF STANDARDS, respectively.

Case No. 29

Inquiry: Is refrigeration piping associated with process operation within the limits of a plant as defined in Par. 302 of American Standard B31.1-1955, Section 3, within the scope of Section 3 or of Section 5 of American Standard B31.1-1955, Code for Pressure Piping?

Reply: It is the opinion of the committee that a conflict exists in the scope paragraphs of Section 3 and 5 on Refrigerant Piping associated with process operation. However, it is the intent of the Code that this refrigerant piping associated with process operation within the limits of a plant as defined in Par. 302 of American Standard B31.1-1955 is within the scope of Section 3, Refinery and Oil Transportation Piping Systems.

For allowable stresses and other requirements and limitations for subzero services see Case No. 30.

Industrial Power Trucks, B56—

Sponsor: The American Society of Mechanical Engineers

Recently elected secretary of Sectional Committee B56 is John Bayuk, plant manager, Lycoming Division, Avco Manufacturing Company, Stratford, Conn. Mr Bayuk is a me-

chanical engineer, with experience as plant engineer for Jenkins Bros, Bridgeport, Connecticut, before joining Lycoming Division. He is a member of the American Materials Handling Society, the American Institute of Plant Engineers, the Society of Professional Engineers, and the Con-

J. Bayuk

necticut Valley Materials Handling Society.

Chairman of the committee is Charles W. Meldram, general manager of the George Industrial Equipment Company, Inc, New York.

Conveyors and Conveying Equipment, B20—

Sponsors: Accident Prevention Department, Association of Casualty and Surety Companies; The American Society of Mechanical Engineers

R. C. Sollenberger, executive vice-president of the Conveyor Equip-

R. C. Sollenberger

ment Manufacturers Association, Washington, D. C., was recently named secretary of Sectional Committee B20. Jervis C. Webb, president and general manager of the Jervis B. Webb Company, Detroit, Michigan, is chairman. (For a report on the American Standard Safety Code for Conveyors, Cableways, and Related Equipment, B20.1-1957, see Mr Webb's article, page 193, MAGAZINE OF STANDARDS, July, 1958.)

Mr Sollenberger is active in many of the national organizations devoted to problems of materials handling. He has served as chairman of the Executive Committee of The American Society of Mechanical Engineers' Materials Handling Division. He is also a member of ASME's Standards Committee. He is a member of the American Material Handling Society, the American Society for Engineering Education, American Ordnance Association, Advisory Council for Federal Reports, and chairman of its subcommittee on Materials Handling Machinery, Munitions Board, and past chairman of its subcommittee on Palletization of Large Caliber Ammunition, and Chamber of Commerce of the United States. In the work of ASA, he is a member of the Standards Council as well as of the sectional committees on Colors for Industrial Apparatus and Equipment, Z55, and of the Safety Code for Elevators, Dumbwaiters, and Escalators, A17. He is also a member-at-large on committee B20, Safety Code for Conveyors and Related Equipment.

Standards for Electric Lamps, C78—

Sponsor: Electrical Standards Board

The system of assigning trade numbers to miniature lamps has been clarified and improved through a new American Standard.

The new American Standard Method for the Designation of Miniature Lamps (C78.390-1958) specifies the procedures to be followed by ASA in assigning and recording miniature lamp designations, in accordance with manufacturers' recommendations.

New methods of designating decorative lamps, such as used on Christmas trees, and of telephone lamps, used predominantly on switchboards, have also been included in American Standard C78.380-1958. Other types of lamps covered by the designation system include those used in automobiles, aircraft, railroads, flashlights, and electronic equipment.

The ASA since 1947 has served as a clearinghouse for the recording of miniature lamp trade numbers under a procedure contained in the American Standard Miniature Incandescent Lamps, C78.140, now withdrawn. The new standard clarifies the procedure and should eliminate confusion in administering it.

In addition to the manufacturers of miniature lamps, some of the groups which cooperated in the development of American Standard C78.390-1958 are: Association of American Railroads; Electric Light and Power Group; Electrical Testing Laboratories, Inc; General Services Administration; Illuminating Engineering Society; National Bureau of Standards; National Electrical Manufacturers Association; RLM Standards Institute; Telephone Group; and Underwriters Laboratories, Inc. Manufacturers of miniature lamps are General Electric Company, Westinghouse Electric Corporation, Sylvania Electric Products, Inc, and Tung-Sol Electric, Inc.

Copies of American Standard C78.390-1958 are available at 35 cents each.

Transmission Chains and Sprocket Teeth, B29—

Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

Recently, William W. Henning, manager of engineering, Farm Trac-

W. W. Henning

tor Division, International Harvester Company, took office as chairman of Committee B29. Mr Henning has been with International Harvester since his graduation from Armour Institute in 1935. Prior to World War II he worked as a design analyst, and during the war on special assignments connected with various defense projects. When International Harvester divisionalized in 1944, he was assigned to the Industrial Power Division as chief engineer, Crawler Tractors, and in 1950 was made di-

visional chief engineer, Advanced Engineering. He was assigned to the Farm Tractor Division in 1955. He has been a member of SAE since 1935 and has served on many SAE professional activities and technical committees.

The scope of Committee B29, revised in 1957, reads "Standardization of power transmission chains, conveying chains, and sprockets."

Coordination of Dimensions of Building Materials and Equipment, A62—

Sponsors: American Institute of Architects; Producers' Council

Study Committee No. 19 on Integrated Ceilings is being organized to coordinate the dimensions of materials and equipment that make up finished ceilings. Murray L. Quin, Day-Brite Lighting, is chairman.

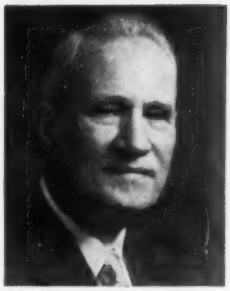
Five subgroups are being organized by Mr Quin to work on lighting, suspension systems, acoustical materials, air diffusers, and partitions.

The Study Committee itself will consist of chairmen of these five subgroups and representatives of the American Institute of Architects, American Society of Mechanical Engineers, and the American Institute of Electrical Engineers. It will work initially as a planning committee to establish principles as a guide for the subgroups. The planning committee will correlate key dimensions with each of the subgroups.

Mr Quin has named the following subgroup chairmen: George W. Clark, Sylvania Electric Products, Inc, chairman of the Subgroup on Lighting; Lyle F. Yerges, U.S. Gypsum Company, chairman of the Subgroup on Acoustical Materials; T. F. Wieczorek, Eastern Products Company, chairman of the Subgroup on Suspension Systems; and Charles J. Nocar, chairman of the Subgroup on Moveable Partitions. No appointment has yet been made on the subgroup on air diffusers. Mr Quin expects to have a meeting on the planning group early in September.

Lightning Arresters, C62—

The National Electrical Manufacturers Association has just been approved as joint sponsor of the project on lightning arresters. NEMA now shares the responsibility with the American Institute of Electrical Engineers, which has been sponsor since 1935 when the project was initiated.



by **Cyril Ainsworth**

DINNSA

(Does Industry Need a National Standards Agency?)

The second objective of ASA as given in Article C2 of the Constitution is "To stimulate the work of existing committees and other organizations competent to formulate standards suitable for approval as American Standards, and to bring about the establishment of committees or organizations for this purpose where they do not already exist. . . ."[1] This statement is one of the keys to a proper understanding of ASA. Of necessity, a full analysis of this objective will have to cover more than a single monthly column.

It has been said, and said many times, that ASA operates to bring into existence a single consistent set of standards designated "American Standard." This statement is based on the second constitutional objective quoted above. It is very clear that this objective calls for ASA to stimulate the development of standards suitable for approval as American Standard, either by existing organizations or by organizations brought into being for the purpose. The member-bodies, in subscribing to this objective, evidently believe that standardization is of such importance to the national economy that everything possible must be done to stimulate the creation of standards of national significance by every competent organization that exists or can be created.

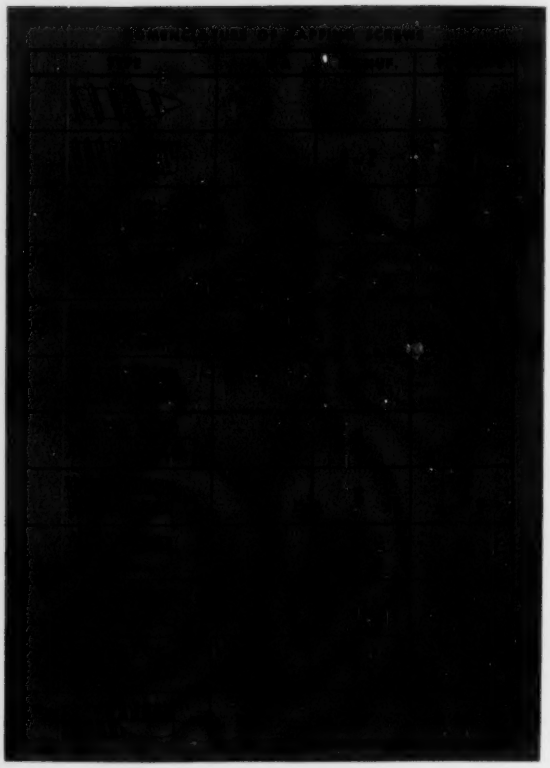
Not only must ASA stimulate the formulation of standards of national significance but it must stimulate the approval of such standards as American Standards. It is natural that many organizations believe that the standards developed under their operations are of national significance. In some cases this will be true. In others, the contention might be challenged. It is necessary, therefore, that there be a method whereby standards can be judged as to their suitability for approval as American Standards. It is good to know that an organization believes its standards are of national significance. It is essential to know also what other organizations think. If there is agreement as to the national significance of a standard, it can be designated "American Standard." ASA was established to provide such a method and the operation of it by ASA has been continuous since its organization in 1918.

It should be clearly understood that, in stimulating organizations developing standards of national significance to secure approval of such standards as American Standards, ASA is not conducting a score board operation. As a public service institution, and operated as such by the member-bodies, ASA is solely concerned with the service rendered to the national economy by the building of the single consistent set of standards designated "American Standard." A federation such as ASA could not operate primarily for the purpose of advancing itself. There is only one way in which ASA can serve —that is in the public interest.

Next month this second constitutional objective of ASA will be analyzed in terms of the authorization that it gives for the methods of procedure provided by ASA for the development of standards by many competent organizations and their approval by ASA as American Standards.

[1] For a discussion of the first objective, see page 187 of the June issue.

Mr Ainsworth has served for many years as technical director of the American Standards Association. He is now deputy managing director and assistant secretary.



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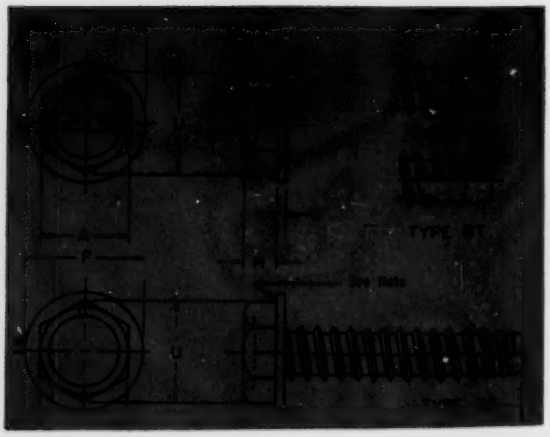

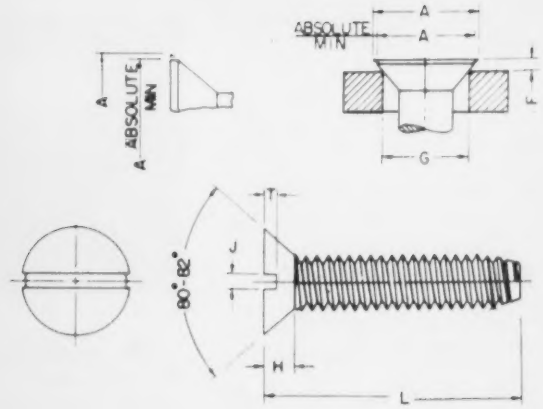

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